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TABLE OF CONTENTS.

ORIGINAL ARTICLES.

1. Adenoids, *G. C. Savage, M. D.,* Nashville, Tenn. ---- 211
2. Diagnosis of Sarcoma, *W. A. Bryan, A. M., M. D.,* Nashville, Tenn. ---- 215
3. Renal Calculus, *Perry Bromberg, M. D.,* Nashville, Tenn. ---- 222
4. The Pathology and Treatment of Chronic Prostatitis, *Wm. Cullen Bryant, M. D.,* Atlanta, Ga.--- 229
5. Malaria as a Cause of Purpura Hemorrhagica, *William H. Deaderick, M. D.,* Marianna, Ark.--- 236
6. Malaria, Its Prophylaxis and Treatment, *Chilton Thorington, M. D.,* Montgomery, Ala.---- 238
7. Anæsthesia, Deductions from One Thousand Cases, *W. M. McCabe, M. D.,* Nashville, Tenn.---- 244
8. Strongyloides Stercoralis, with Report of Three Cases from Tennessee, *Clinton E. Brush, B. S., M. D.,* Nashville, Tenn. ---- 248
9. A Discussion of the Actions of Certain Drugs on Blood Vessels, *J. Birney Guthrie, M. D.,* New Orleans, La. ---- 253
10. Ectopic Gestation, *John Overton, M. D.,* Nashville, Tenn. ---- 259

EDITORIALS.

The Existence of Tropical Diseases in the South---- 269
The Water Supply of Cities ---- 269
Atlanta Meeting, S. M. A.---- 270

ABSTRACTS OF CURRENT LITERATURE.

MEDICINE.

The Symptoms and Condition of the Blood in Pernicious Anemia ---- 271
Ophthalmo Reaction of Typhoid Fever ---- 271
The Tuberculin Salve ---- 272

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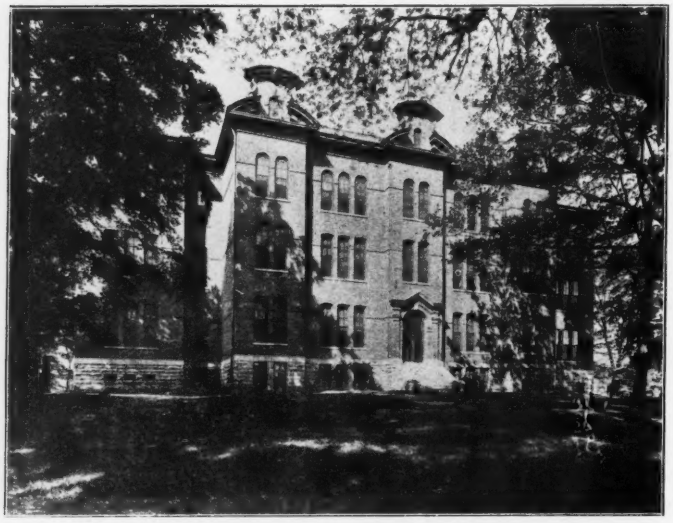

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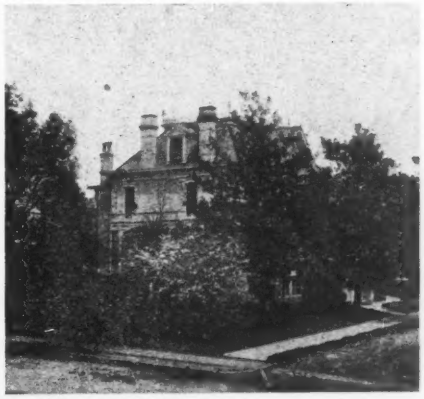

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TABLE OF CONTENTS—CONTINUED.

OBSTETRICS AND ABDOMINAL SURGERY.

Treatment of Acute Mammary Abscess 272
The Treatment of Appendix Abscess 273
The Necessity for the Removal of the Appendix after Perityphilitic Abscess 275

SURGERY.

The Radical Treatment of Carcinoma of the Bladder 276
A New Technic for Nephropexy 277

DERMATOLOGY.

Treatment of Burns 278
On the Transmission of Syphilis to the Third Generation 278
Note of the Comparative Influence of the Parents in Hereditary Syphilis 278

EYE, EAR, NOSE AND THROAT.

When and How We Use Cycloplegics in Refraction Work 279

NOTICE.

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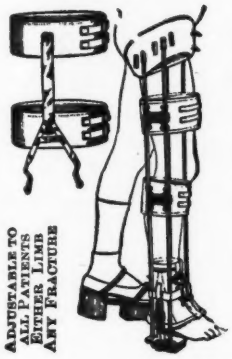

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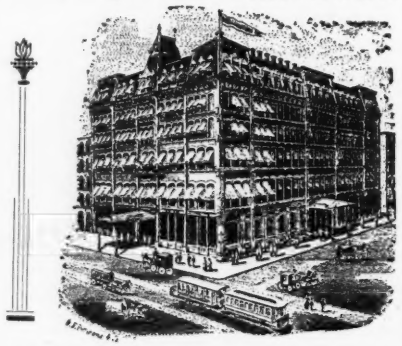

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L. D. COTTEN, M.D.

Sparta, Tenn.

Through the columns of the daily press I see that you aggressive Nashville fraters are launching the "Southern Medical Journal." I most heartily greet the advent of just such a publication, and congratulate you. For some time I have felt the need of a medium of this character in order that our Southern brethren may be in closer touch. Please have my name placed upon your subscription list.

EDGAR DUFF BURNETT, A.M., M.D.

Louisville, Ky.

One needs but to refer to the editorial staff to feel assured that your journal will rank among the best published. The work of such representative men will be eagerly sought for and appreciated by the medical profession throughout the South, and I know will co-operate in making it the success it deserves.

B. D. SIBLEY, M.D.

Birmingham, Ala.

Thank you very much for the copy of your journal. It certainly puts up a very good appearance, and, it occurs to me, that we should have it on our list of subscriptions. Enclosed please find $2 for one year's subscription.

Sincerely yours,

C. H. MAYO, M.D.

Rochester, Minn.

I have your letter of recent date, asking my opinion of the "Southern Medical Journal." In reply, I will say that I subscribed for the journal simply because a friend asked me to, and gave the matter little thought so far as the real value of the journal is concerned. I tell you frankly, however, that since receiving the first copy I find that I am already a friend to the journal, and I see no reason why it should not prove a perfect success. I cheerfully recommend this journal to other physicians who wish to read good "stuff," written by men whom we know to be of the right material. Wishing you much success, I remain,

Yours very truly,

M. A. COPELAND, M.D.,

Birmingham, Ala.

Replying to yours of recent date in regard to the "Southern Medical Journal," I will say that it certainly fulfills the promises made by the promoters in putting it before the profession, and, if it continues in the way it is started, taking full advantage of its natural growth, the future holds great things in store. It is bound to be a strong factor in shaping medical thought throughout the South, developing better medical writers and putting the essentially Southern phases of disease better before the world. It has a wonderful field from which to select, and one that has only been partially covered in the past by State and independent journals.

F. B. YOUNG, M.D.

Springfield, Ark.

The first two issues of the "Southern Medical Journal" have been carefully read by me, and it is simple conformity to the logic of the situation that bids me congratulate you on your product. As a distinctly Southern creation it stands without a rival. I am pleased with every department, and feel that you are to be especially commended for excluding every form of patent medicine, and other forms of fraudulent advertising.

I confidently believe that in less then three years your journal will enjoy a greater degree of popularity in the South than any other medical publication.

Most sincerely yours,

W. W. CRAWFORD, M.D.

Hattiesburg, Miss.

As I am a collaborator of and contributor to the "Southern Medical Journal," I do not think it would become me to express my commendation.

I think, however, that the editors deserve the greatest credit, and I feel proud of my company. Also, it may interest you, as publishers, that I have received letters and inquiries regarding my articles on malaria from Florida, Mobile, Texas, remote points in Arkansas, Mississippi, Alabama and Louisiana. In fact, judging from letters received, these articles have been more widely read than anything I have ever produced.

WILLIAM KRAUSS, M.D.

Memphis, Tenn.

The South has needed for years a journal just exactly what the "Southern Medical Journal" now represents. We are to be congratulated.

Yours very truly,

F. P. CALHOUN, M.D.

Atlanta, Ga.

The quality and usefulness of any medical journal is dependent upon the quality of the men behind it; hence, when I take into consideration the geographical diversity and personelle of both the editorial staff and collaborators of this valuable exponent, many of whom I know personally, I am at once convinced of the fact that SUCCESS surely belongs to it, and that MANY GOOD THINGS are in store for those who peruse its pages. Therefore, I most heartily recommend it to my confreres, and urge that those who are not already subscribers to it become so at their earliest possible date.

S. LEWIS KNIGHT, M.D.

Hattiesburg, Miss.

The "Southern Medical Journal" is filling a place in Southern medical literature that has long been vacant. The excellence of its articles and the care with which it is published should obtain for it a high rank among the medical journals of the world.

Yours turly,

J. SHELTON HORSLEY, M.D.

Richmond, Va.

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ADENOIDS.

G. C. SAVAGE, M.D., NASHVILLE, TENN.

Five masses of lymphoid structure form a broken ring around the naso-oro-pharynx anteriorly. A part of this is found at the base of the tongue and is known as the lingual tonsil; a part is found between the pillars of the fauces on either side and is known as the faucial tonsil; still another part is found at the vault of the pharynx and is known as the pharyngeal or third tonsil, the Luschka tonsil, and, when enlarged, as adenoids. In this paper only the pharyngeal tonsil will be studied, although diseases of the other parts named are of no mean importance.

The third or pharyngeal tonsil exists in every person and doubtless has some important function to perform not yet fully understood. One of the diseases to which it is liable is chronic inflammation with hypertrophy. It is only when enlarged that the pharyngeal tonsil becomes a source of interference with other important functions, and at such time only should there be any surgical interference with this structure.

The functions with which adenoids interferes can be better understood by a brief study of its location and relationships. It is located in the anterior part of the roof of the pharynx, and, in practically all cases, would be bisected by the median plane of the body. Its anterior border approaches the posterior extremity of the nasal septum and its body hangs just behind the two posterior nares. On either side is found the pharyngeal opening of the corresponding eustachian tube. Its base is about five-eighths of an inch across and is almost circular. Its body is not often wider than its base, though it is sometimes expanded. Its depth may occupy the space intervening between the vault of the pharynx and the soft palate, but usually it is not so large, often being, even when dangerous, not more than one-fourth so large. Its surface is ribbed antero-posteriorly, the grooves separating these diverging from before, back. There are no tubes in the pharyngeal tonsil, such as are found in the faucial tonsils.

The functions interfered with directly by adenoids are respiration, audition and vocalization. Remotely the general health may become impaired and even life itself may be jeopardized.

Nasal respiration, both by night and by day, is essential to general good health. Air inhaled through the nasal passages undergoes three important modifications: first, the hairs in the vestibules of the nose strain, more or less perfectly, the inhaled air by catching foreign particles that would be a source of irritation to delicate mucous membrane of the lower air passages; second, as the air passes through the nasal passages it acquires the warmth, from the abundant blood supply,

necessary to render it non-irritating; third, the serous glands in the nasal mucous membrane furnish a sufficient amount of moisture to the inhaled air to prevent the drying of the mucous membrane of the lower passages. Air inhaled through the mouth is deprived of these three changes, and must excite irritation in the pharynx, larynx, trachea and bronchial tubes. The presence of adenoids is one of the common causes of mouth breathing. Their size determines whether nasal respiration shall be interfered with only when the patient is asleep, or at all times. Complete nasal obstruction means perpetual mouth breating. A moderately enlarged third tonsil permits of nasal respiration during waking hours; but when sleep comes the space between the adenoids and the palate becomes more narrowed, either because congestion at such time makes the growth larger or because the palate rises in sleep, and mouth breathing becomes a necessity. The mouth-breather is in greater danger of contracting bronchitis, pneumonia and tuberculosis than is the nose-breather. Chronic laryngitis with huskiness of voice is one of the conditions developed by mouth breathing. Deformity of chest and disfigurement of face are results of mouth breathing. The absence of lip pressure allows the upper incisors to project far forward, while the lateral teeth are less widely separated than they should be, and the hard palate is more deeply arched.

For some reason, hard to understand and harder to explain, the mental development of a mouth-breating child is faulty. The countenance looks dull and listless. The proper treatment of such a child brings about a marked change in mentality and in appearance.

The ears are in constant danger from adenoids. To affect the hearing and to cause disease of ears to develop, the growth need not cover the mouths of the Eustachian tubes. In order that the ears may be healthy and the hearing good there must be perfect aeration of the drum cavities. This is possible only when there is uninterrupted nasal breathing. The ingoing and outgoing currents of air, passing over the mouths of the Eustachian tubes, constitute the perfected means of aeration of the middle ears, hence it is easy to see how adenoids affect the hearing. An imperfectly aerated ear becomes congested, the membrane thickens and the chain of bones becomes stiff. Pus germs entering such an ear find the field prepared for their multiplication and destructive work. The presence of adenoids adds to the danger that measles and scarlet fever may cause suppurative inflammation of the middle ear. Adenoids add to the danger that a common cold may cause the ears to inflame.

Finally the voice suffers directly and indirectly from the presence of adenoids. The obstruction to nasal expiration gives to the voice what is incorrectly called the nasal tone, that is, the voice fails to undergo that pleasing modification which comes from well-opened naso-pharyngeal and nasal cavities. Indirectly the voice is husky and broken because of changes in the larynx caused by mouth-breathing. Tuneful singing is not possible when there is nasal obstruction. The large open nose of the negro explains why he is a louder, if not a better singer than the white man. Incidentally it may be said here that adenoids are not common in the negro. Narrow nasal passages may predispose to enlargement of the pharyngeal tonsil.

Since there are other conditions than adenoids that may hinder, or even obstruct, nasal respiration a diagnosis is necessary. Examination of the nose anteriorly is easy, even when the patient is a small child. Posterior rhinoscopy is not so easy and with children is often impossible. Finding no cause in examining through the nostrils, a diagnosis may be made by passing the finger through the mouth into the naso-pharynx. The trained finger tells immediately of the presence or absence of adenoids. But this is painful even when co-

cain has been applied, and is wholly unnecessary. The adenotome can be used for making the diagnosis and for doing the operation at the same moment. This instrument properly used gets the growth, if it is present, and hemorrhage more or less profuse follows. If there is no growth there is no bleeding and of course nothing has been removed. Bleeding, to amount to anything, means that the growth has been cut off even if nothing is seen but the blood, for children sometimes swallow the mass.

TREATMENT.

The treatment of adenoids is purely surgical, and the value of treatment cannot be over estimated. General anesthesia is unnecessary and, being attended by some danger, should not be resorted to. Cocain applied on a pledget of cotton in the naso-pharynx makes the ideal operation easier, but does not render the procedure entirely painless. The duration of the operation, however, is so short (one-quarter of a minute or less) the slight pain under cocain may be ignored. The instruments necessary for doing the operation are, an applicator, a tongue depresser, a head mirror, and the Gradle adenotome. Sometimes in a stubborn child a mouth gag is essential. The adenotome was invented by Dr. H. Gradle, of Chicago, about eight years ago. My attention was directed to it when his book first came from the press, about five years ago. The cut and description of the instrument so pleased me that I at once ordered one, and from that time to the present I have used no other means for removing adenoids, either in children or grown people. I have used it in cases varying from two to twenty-seven years of age, the great majority of the cases ranging from five to twelve years of age.

In five minutes after the cocaine has been applied the patient is ready for the operation. Two assistants are essential in any case and a third is sometimes needed. One assistant must hold the head in allignment with the body, the patient being in the sitting posture; another assistant must hold the patients hands; the third assistant is needed only when the mouth gag must be used. The operator, sitting in front of the patient, presses the tongue down with the depressor, throws the light into the mouth by means of the head mirror, and then passes the adenotome into the patient's mouth with the curved end looking toward the patient's left. While in this position the curved end of the instrument is passed behind the left posterior pillar of the fauces, when the instrument must be quickly turned so that its curved end shall look dirdectly up, that it may be passed readily above the palate. At this moment the operator's right hand grasps the handle of the instrument and his index finger is placed on the trigger that must move the concealed blade. In this position the adenotome is drawn forward until it comes in contact with the posterior margin of the septum, while, at the same time, it is being pushed upward against the vault of the pharynx. This is a kind of double movement which can be acquired easily. In this position the adenoids must fall into the fenestrum to become imprisoned. Now the trigger is pulled quickly and powerfully so as to make the knife remove all that is enclosed by the fenestrum. This done, the adenotome is quickly and easily removed. The clipped mass either comes out with the instrument, although there is no device for holding it, or a little later it passes into the oro-pharynx, whence it is expelled with the blood that is flowing backward. In only one instance, in my observation has the mass been blown through a large nasal fossa and out through the nostril. Occasionally the mass falls down on the soft palate, where it remains for a few minutes, sometimes for an hour or more, to be finally dislodged and expectorated. Very young children may swallow the mass. Bleeding through the nostrils and posteriorly is always more or less profuse, if adenoids have been cut off. No bleeding means that there

was no growth to be removed, hence, no operation having been done, only a diagnosis has been made.

Other instruments, such as curette and forceps, and even the finger, are not worthy of comparison with the *adenotome*. I can account for its not being in general use only on the hypothesis that Dr. Gradle's book has not been read generally, and, so far as I know, no one has written about it in the journals. Wishing to know how much the instrument is valued by its inventor, after the lapse of several years, I addressed him a letter a few days ago, to which I received the following reply: "Since the last eight years I have used my instrument exclusively for adenoid operations in primary cases. It is quite exceptional that I find any remnants after operation—perhaps in five per cent.—and these are usually insignificant. The pain is so slight and transient that I find narcosis unnecessary. All colleagues who have spoken to me about their experience with my instrument, confirm my experience. I have, however, seen no published record of others." Dr. Gradle has not spoken too highly of his adenotome, nor has he overstated his successes.

DIAGNOSIS OF SARCOMA.

BY W. A. BRYAN, A. M., M. D., NASHVILLE, TENN.

(*Continued from September Number.*)

Passing to the second division of the subject, the discussion will be confined to a differentiation between sarcomata and those swellings which are most likely to confuse the diagnostician. Here, again, the lines are not and cannot be drawn clearly and unmistakably by clinical methods, aside from the microscope; so that if the very fact that doubt does exist can be used to arouse suspicion of malignancy in these border-line cases, the purpose of the writer will be well accomplished.

In reviewing the literature and in attempting to recall the cases where I have seen mistakes made over sarcomata, it appears that the differentiation is difficult between sarcoma and carcinoma, sarcoma and gumma, sarcoma and tubercular swellings, probably more frequently than in other cases. Yet the fact that certain benign tumors develop rather rapidly and certain sarcomata develop slowly and conceal the evidence of malignancy renders it necessary to consider certain of the benign tumors in this connection, especially fibroids, chondroma, osteoma, and adenoma, particularly, if it be of thyroid origin.

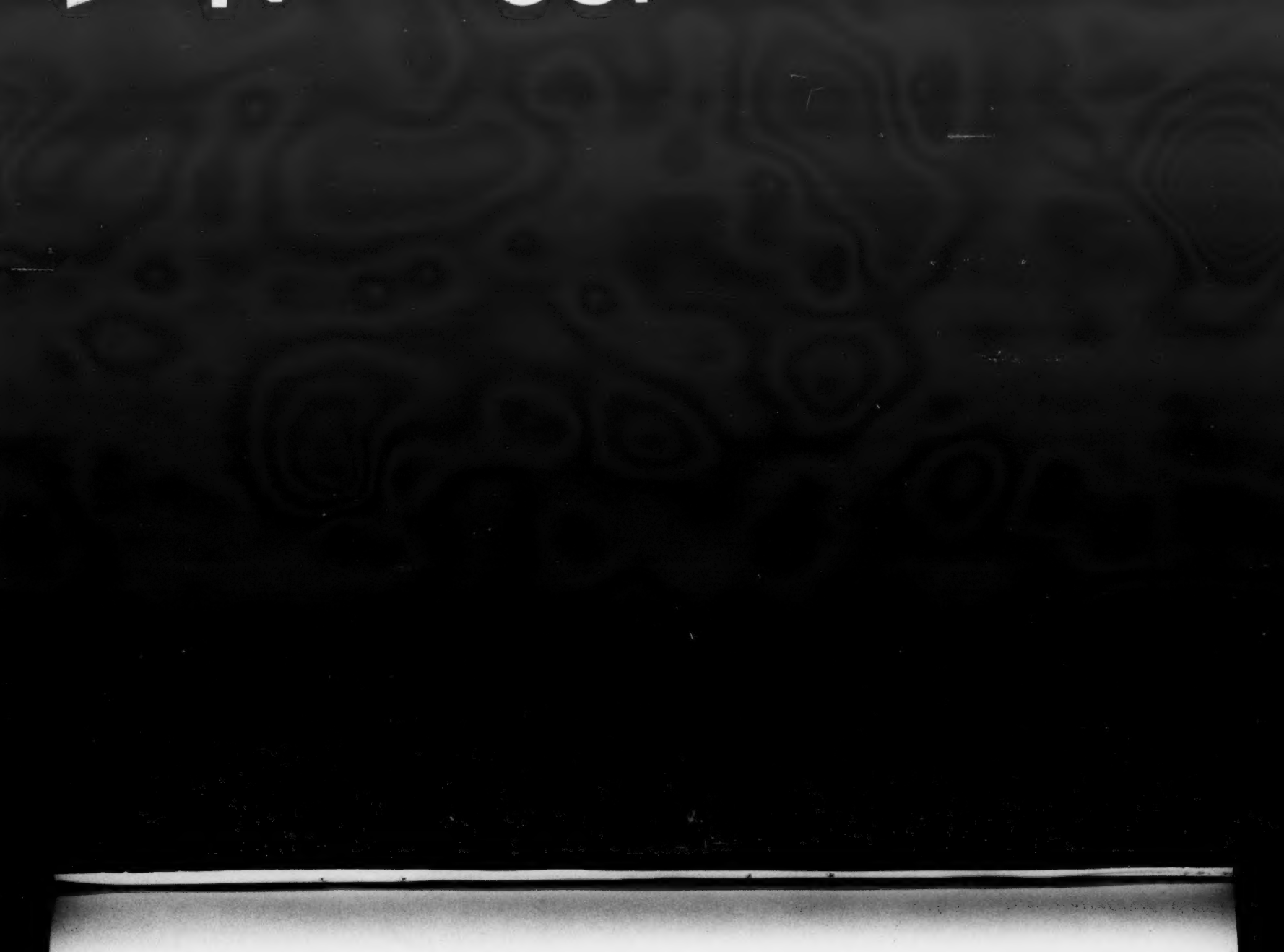
Great stress is laid in our teaching on the difference between sarcoma and carcinoma; too much stress, perhaps, since it is usually done to the neglect of differentiating these growths from benign conditions and the advice in case of a malignant growth is the same, if seen early enough, and imperative, but the delay of uncertainty between malignant and benign growths often results fatally. Sarcoma is on an average a larger tumor than carcinoma, yet to await this means of diagnosis is little less than criminal. Sarcoma grows more rapidly than carcinoma, except in the encephaloid variety of the latter. The situation—I speak only of primary growths—of sarcoma, since it is of mesoblastic origin, is not connected with epithelial tissues, but arises invariably from connective tissue, and so is situated more deeply than cancers are, and originates in histological regions that have no glandular or tegumentary tissue; while cancers originate in structures that contain epiblastic or hypoblastic tissue. In those glands containg large amounts of connective tissue, sarcoma or carcinoma either may arise. I would not be misunderstood to mean that sarcoma is always deep under the integument even in its incipiency, for it is often found in the skin, sometimes in or immediately beneath the mucous membrane. That sarcoma is the malignant tumor of youth and carcinoma that of old age is no longer tenable; for cancers appear now and then in the young, rarely, but sarcomata are frequent in the old, and may be found at any age, though varying with age in their predilection for certain organs, as will be shown later. When the number of individuals under 30 years' old and those over that age is considered, it is doubtful to my mind if the percentage of sarcomata is any greater in the young than in the old. Since writing the first part of this article, I have seen a sarcoma of the right labium majora in a woman 56 years' old, and one of the foot in a man aged 46 (see Figs. 7 and 8). These alone prove nothing, but taken in connection with the average age given before, they do not change it considerably.

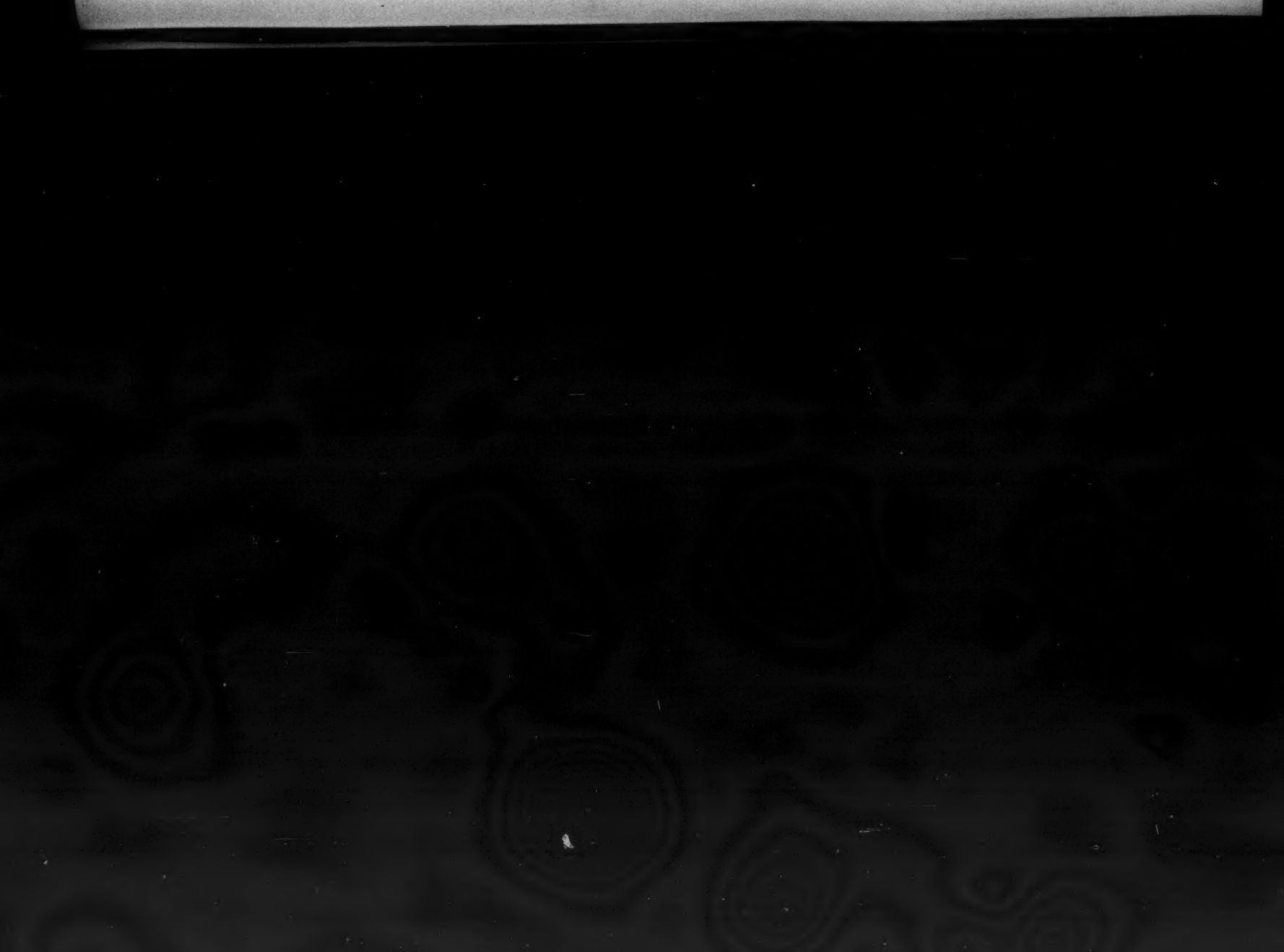
Sarcoma is often encapsulated seemingly at its beginning (see Fig. 7), and carcinoma is not unless it starts as a benign growth. Hence,

in a question between the two early in their development the more movable it is the more probably it is sarcoma. Sarcoma has but little connective tissue; carcinoma has much; one might say that the connective tissue of early sarcoma is outside of it, in a capsule, and that of carcinoma is inside of it acting as stroma, hence early one is substantially isolated from the surrounding structures, while the other is connected directly with the surrounding connective tissue. Therefore, retraction of the nipple and Halstead's sign are in evidence in carcinoma of the breast; in sarcoma they are not. It may be put this way, that sarcoma has a greater tendency to push other tissues aside, and carcinoma to bind them into one mass. Involvement of the lymph-nodes is a classic sign of carcinoma, and in sarcoma, unless in the testicle or tonsil, it is rarely seen. This evidence of lymphatic invasion is very valuable, when present, from a standpoint of diagnosis, but is sadly late for its unfortunate host, and one would suppose that no physician had his patient's interest so little in view as to await such information. The sudden enlargement of the tumor, due to concealed hemorrhage in the tumor substance, dilation of the veins in the skin overlying large sarcomata, the formation of cystic accumulations in the tumor tissue are common in sarcoma, and are rare in cancer. Ulceration and hemorrhage, plus saphrophytic, and maybe pathogenic, infection, with the associated loss of fluids and increased progress of cachexia are seen oftener in cancer, while pigmentation and association of malignant elements with the various benign tumors is found in sarcoma. Metastases remote from the primary focus are more likely to be found in sarcoma, just as those situated close to it, but out of the line of the lymphatics, indicate a similar conclusion. When large a globular or spindle-shaped tumor is much more likely to be of mesoblastic origin.

Gumma has probably been confused with sarcoma much more frequently in the past than will happen again. So true is this that I have a dissertation, read in 1893 by Heinrich Mehler on the treatment of sarcoma with potassium iodide. In this paper Mehler boldly takes the stand that a considerable number of mesoblastic malignant tumors are amenable to anti-syphilitic treatment for tertiary lesions, and quotes extensively from other authorities to substantiate his conclusions. This view has been expressed often, and even yet some hold that malignancy is either a more or less remote result of syphilitic poison or a twin sister to the tertiary lesions, especially gummata, of syphilis.

Syphilis is much better treated now than formerly, so that likely some considerable percentage of physicians never saw a gumma. The fact that the patient has had syphilis should lead one to suspect gumma if a tumor presents, this all the more if it can be shown that treatment was inadequate; that treatment of syphilis is often inadequate, any one who is called upon to observe large numbers of cases in the practice of large cities is prepared to corroborate, largely, it appears, from negligence on the part of patients, rarely to hasty treatment with imperfect diagnosis. Confirmatory signs should be sought to sustain a diagnosis of gumma. If still doubtful the wisest course is to call the aid of the microscope; it is no harm to investigate a gumma; it is frightful to neglect a sarcoma. If the mass be so situated as to preclude the employment of surgery, or where one cannot get a piece for section, then the therapeutic test should be administered rigorously. Let me repeat, to decide between gumma and sarcoma is difficult; syphilitics may have sarcoma; the therapeutic test is a good one, but in case the tumor is sarcoma, does no good and causes the patient to sit the time of such treatment beneath a sword of Damocles that may fall at any moment, and send metastases through his vessels silently but as sure of a





fatal end as that it has been allowed to pass some unknowable second, that marks the boundary between curable and incurable sarcoma. The best index to one's ignorance of tumors is the time he advises them "to wait and see." Ideal results even with our present imperfect knowledge cannot be hoped for until there shall issue from the lips of every physician who sees a suspicious tumor "now is the accepted time; today is the day of salvation."

More of my mistakes in diagnosis of swelling have been between tubercular processes and sarcomata, when arising from bone or periosteum. This can now be disposed of easily and surely by the use of tuberculin, which is very positive when used on tubercular subjects. Failure is possible in one way, namely, if there should be tuberculosis and sarcoma both present in the same individual. The reaction to tuberculin does not require many days, as a rule not over two or three, and as a limb is usually at stake, tuberculin should never be forgotten in doubt between these two. It may not be amiss to observe here that though Calmette's ophthalmo-reaction is very simple in application, as its use has extended, there are a considerable number of damaged eyes reported, and so either the cutaneous or hypodermic administration of tuberculin will likely remain as the safest and most reliable tests for obscure tubercular lesions. I operated on a young man a year ago who had been advised by good physicians to have an amputation above the knee for a sarcoma in the upper end of the tibia. He was given tuberculin, to which he promptly reacted, and the bone was opened, the pus and carious tissue removed, leaving him a good leg. The use of tuberculin is so simple and so reliable that it should be used in all doubtful differentiations, not only between these two, but to distinguish tuberculosis from any other deceptive lesion.

FIGURE 7.—Myxo-sarcoma of labrium majus in woman ,56 years old. The chief diagnostic feature was that the tumor reached the size of a lemon in less than a year's time. Note the distinct and complete encapsulation. The capsule has been dissected back for demonstration.

Fibroids are to be differentiated from sarcomata if possible; for it is impossible in many cases to say clinically whether a tumor is fibroma or sarcoma. It is furthermore impossible to say that any fibroid, however benignly it may behave today, has not actively growing

sarcomatous cells in its substance. Hence the futility of advising patients to carry fibroids "in as much as they will cause no harm, and in as much as they will *likely* disappear later in life." There is no such thing as being positive that any fibroid is harmless, or that it will not become malignant, or that it is not already malignant, or that it will disappear ever. The odds are a thousand to one against disappearance. This statement sounds pitifully absurd and needless, yet twice in the last two months has the statement been made to me by women that their physicians had diagnosed tumors and insisted upon leaving them alone, "for they would disappear at the climacteric." One of these women following this blunder confidently, was operated for a large sarcoma ten years afterward (see Fig. 3), and the other having similar confidence in her physician, now, two years after the advice, is the host of an inoperable uterine cancer. Whose fault is it? We may insist upon application of the classical differentiation, between benign and malignant tumors to the specific case in hand, and say that the fibroid grows slowly, does not infiltrate, does not produce metastases or emaciation, while sarcoma does produce all these and more; that the former grows slowly and the latter does not. This is all very true so far as it goes, but so long as men rely on it and advise one way for one side and another for the other side, so long will the surgeon return enormous percentages of recurrences in his statistics and be embarrassed by the censure, so readily bestowed, that if the tumor had not been operated on it would likely not have "scattered." There are extremes on either side, where one can be absolutely certain that this tumor is malignant, and fairly certain that that one is not, but as we come nearer the border between the two, the lines of differentiation fade and it is hopeless to tell the difference. The more zealous one has been in one's study of tumors and the more one has considered the operative results, the more that one becomes sure not of infallible powers of diagnosis, but of the fact that a fair deal to the patient can be done only where he is advised to have the safest, the most conservative treatment while there is yet time.

Again, we may notice the evidences indicating that a fibroma has assumed a malignant form. The statements are true for other benign tumors as well. The appearance of rapid growth in a tumor that has been growing slowly for a long period of time or had long ago ceased to show signs of growth, is very significant and if another positive explanation of this increase cannot be given, it becomes practically a certainty that the change is due to malignancy. If at the same time the consistency of the tumor changes and it becomes softer as it grows larger, this favors malignancy. In case of fibroids of the uterus the tumor becoming malignant may not grow alone, but the uterus may enlarge so rapidly and become so soft as to render a suspicion of pregnancy highly probable unless the evidence against pregnancy or in favor of malignancy can be made positive. I saw one of America's most brilliant surgeons "back out" from an abdomen recently in a case of this kind, preferring to await a microscopical section to justify him in operating later or refraining from it. His words were, "There are only two conditions capable of producing rapid enlargement and softening of a uterus bearing fibroids; one is pregnancy, the other is malignant change." It must be borne in mind that where multiple fibroids are present or where multi-lobulated tumors are concerned the changes of tumor tissue due to malignancy do not occupy the whole mass necessarily, but confine themselves to the parts involved.

In those cases having suspicious tumors of the lower jaw there is a danger of mistaking an odontoma, of which there are several varieties. So that it becomes necessary to bear in mind that such mistakes have been made re-

sulting in excision of the mandible for what proved too late to be an innocent tumor or a cyst. Attention should be called to the fact that both tumors, especially those likely to be confused with sarcomata are apt to have a history of an unerupted tooth at or near the site of tumor formation; that this tumor is likely to reveal the presence of tooth tissue in its substance if punctured by a sharp steel needle; that odontoma is very unlikely to grow as rapidly as sarcoma does; that it is more probable in that part of the jaw that gives origin to the tooth tissue; that it does not if left alone infiltrate and produce secondary growths, and that if the nature of the growth is still not clear a skiagraph will likely show the presence of the abnormally situated tooth or teeth. In case of uncertainty yet, a section must be made for the microscope.

Aneurysm may usually be distinguished with ease, provided a clear history can be obtained. A pulsating sarcoma situated over the course of a large blood vessel may cause confusion. The age of the patient, the condition of the arteries, the absence of a lesion likely to cause aneurysm, the irregularity of the shape or surface of sarcoma, and the uneven density of its surface, together with the pulse signs, viz.: delayed pulsation distal to the tumor, enlargement of the tumor on blockage beyond the swelling and reduction of size by pressure on the proximal side, if duly considered usually differentiate them. If deep, especially if situated in an abdomen or thorax of a stout individual, only an exploratory operation or the evidence of delay may bring a just conclusion, yet the fact that visceral sarcoma often produces fever may aid considerably. (Figs. 9 and 10.)

Angiosarcoma is not a congenital growth. Cavernous angioma in most cases is congenital and so shows up at an earlier average age than angiosarcoma, even though it may not show up until some time after birth, yet angiomata may come in the old. Dubreuilh and Paul Broca have discussed at some length the angiomata that occur in the skin of old people. They are known as senile angiomata and, Broca says, increase in frequency with age. They do not concern us here. However, there is another type of angioma called traumatic angioma, which may be confusing, in the light of the fact that sarcoma so often is preceded by injury. These angiomata

FIG. 8.—Large round-celled melanotic sarcoma of foot. Negro man, age 46. This tumor developed in a cicatrix following a cut in 1905, and showed its first signs eight months ago.

follow either contusions or repeated and prolonged friction. In these cases the rate of development and the microscopical findings will give the only reliable proof. The latter are found chiefly in the subcutaneous and intermuscular tissue. They grow very rapidly and owing to their enormous blood supply, often pulsate vigorously. They are not encapsulated even from the beginning.

Recently two series of cases were reported of benign tumors, so far as microscopical evidence could show or the ultimate clinical effects evince, which produced metastases. One of these was a group of adenomata showing unmistakable evidence of thyroid origin, yet at times with no evidence of a primary thyroid tumor, and the other a collection of chondromata, which seemed to be metastatic. These are mentioned more as pathological curiosities, than as having any especial diagnostic value. They are so rare as to be of no clinical value, and the presence of metastases must continue to be accepted as positive evidence of malignancy and as evincing the most ominous prognosis.

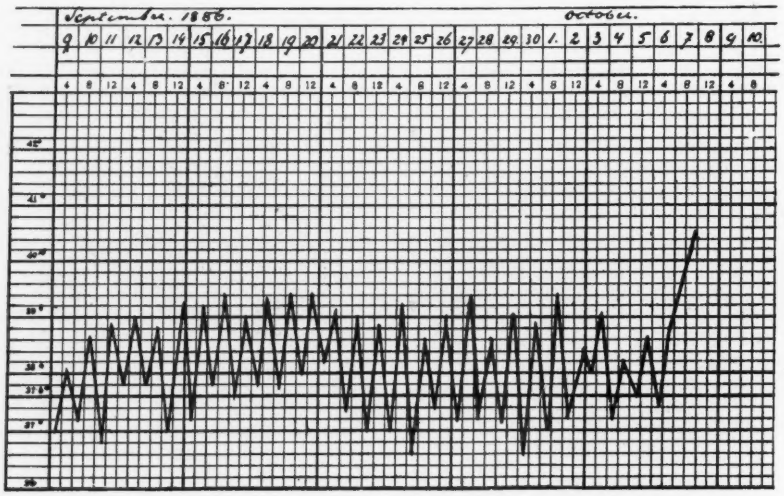


FIG. 9.—Illustrating temperature course in sarcoma of the internal organs. From Petrina.

Sarcoma of bone may be confused with benign tumors or tubercular conditions, both of which if they cannot be cleared up under the general directions given above, must have recourse to the microscope. Osteo-sarcoma does not mean that the tumor must have bone tissue in its substance, but that it originates in or is connected with bone. It may be deep, central sarcoma, or superficial, called periosteal sarcoma. Bone tissue is caused to absorb especially by the central type until it becomes so thin that it yields under pressure of the finger, like the skull of a syphilitic child, or is so reduced that the tumor substance protrudes and even produces pulsations and bruit. It is in these that pathological fractures occur, which should always demand the minutest investigation to eliminate malignancy. These tumors may be exceedingly insidious, even showing no signs until fracture has occurred. Bone sarcomata near joints do not cause the usual flexion that accompanies inflammatory conditions. There may be more or less motion at the level of the thinned bone without crepitus. I said above that osteo-sarcoma does not mean that the tumor contains bone, therefore they are soft. Yet ossification or chondrification may occur imparting to the extent of such change hardness, which may be unequally distributed in the substance of the tumor. This, as is readily understood, occurs more often in the periosteal type. A rare condition, myositis ossificans, is capable of confusion, but by skiagraphy or microscopical examination there need be no mistaken operative procedures. It must not be forgotten that sarcoma of bone casts a lighter shadow, while inflammatory

thickening casts a darker shadow than normal bone.

The third item as set out in the beginning of this paper is "to impress that the benign tumor to-day may at any time in the future assume malignant characteristics, and to accept the teaching of the microscope that there are many tumors which, from present clinical showings, seem benign, but are in reality malignant." The value of this fact—we do not know positively that all tumors that ultimately become malignant do not have malignant elements in their substance from the beginning; nor that we are, pathologically speaking, correct when we say that a benign tumor becomes malignant—the value of this fact, I say, is so great that it should come uppermost in the mind of the diagnostician whenever a tumor almost of any kind, however innocent, presents itself. It will save much unwary advice, much fatality, many inoperable cases to create the suspicion in both the minds of physicians and the public that any tumor is a risk. The more one refers one's cases to the microscopist and gets the reply that it is impossible to say whether this tumor has become distinctly malignant, but that it certainly was growing in that direction, or that this tumor evidently was benign and has to all appearances recently assumed a malignant departure in certain portions of its substance, or that this tumor not yet to be classified, the more one feels dependent on the microscope to be competent to pass on many situations, the more one understands that without that one's work is a groping in darkness and unfair both to ourselves and the patient. It is a wholesome feeling to make a diagnosis cock-sure of benignity and later to have an unquestionable diagnosis of malignancy returned from the laboratory. The age limits accepted and all other conditions accepted in a nominal way are broken down in practical work, and while the microscope cannot be considered infallible certainly in all hands, it remains the ultimate judge as yet of our action relative to tumors. May I be pardoned for adding that the microscope is not enough, there should be a well-trained pathologist, whose time is spent in the laboratory, at the eye-piece. Thrice recently have I seen this fact illustrated. One was a most benign looking movable nodule in the left breast of a woman twenty years of age. The tumor had grown to the size of a hazelnut in a year's time. It was excised and the pathological report was as follows: "The tumor is adenoma, yet its cells are beginning to invade their connective tissue base and if the

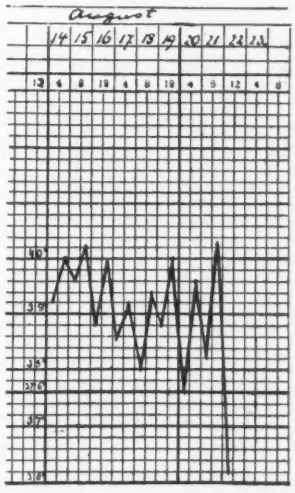


FIG. 10.—Temperature chart from a case of visceral sarcoma. From Petrina.

tumor had been left *in situ* six months longer it would likely have shown a typical carcinoma." Another case, shown in Fig. 7, was diagnosed as benign and probably lipoma in the labium majus; this is shown by the microscope to be a myxo-sarcoma. A third case was a raw ulcerated surface the size of a silver dollar on the scrotum of a man forty-five years old. It was diagnosed epithelioma, "cancer," in the words of the patient and amputation of the scrotum advised. The ulcer healed in two weeks' time under local treatment.

The error may thus be in two directions. It is sad enough to fail to know a malignant tumor when present, but it is, if possible, sadder to act for malignancy when there is a harmless lesion.

RENAL CALCULUS.

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If we remember that the urine is merely a solution of various crystalloid substances, whose solubilities are variable, we will have no great difficulty in appreciating the many factors, which, acting together, tend to reduce the amount of the solvent water, which results in either, an excessively concentrated solution of the urinary salts; doing no harm, further than irritating the uro-genital tract; or, becoming cemented together around a fragment of organic matter, as a particle of mucous, pus or blood, forms the nucleus for a stone. It is not always necessary for the urinary solvent water to be reduced in quantity, for various conditions of life are capable of increasing the amount and the character of the urinary salts beyond the solvent power of a normal quantity of water.

Alterations in the reaction of the urine, either in its acidity or its alkalinity, favor the deposition of solid matter, which, finding no organic substance to glue it together, may be washed from the kidney as urinary crystals easily recognizable with the microscope; or, finding in the kidney favorable conditions, as a blood clot, a parasite, a cluster of epithelial cells, a fragment of mucous, etc., accretion begins and a stone is formed. Some authorities go so far as to claim that bacterial action is always necessary to the formation of a stone in the kidney. While it is quite easy to understand how bacterial infection, in various bacteriemic diseases may travel to the kidney, there acting as an irritant to the delicate epithelium, could produce a catarrhal exudate which might serve as a nucleus for crystalloid deposits, still I cannot believe that the presence of bacterial infection is essential, in view of the fact that stones are often found in the new born, in children who have never suffered from infectious disease, and, in fact, in most persons it usually affects the otherwise well and healthy. I would certainly not go so far as to say that bacterial infection plays no role in the formation of calculus, but I cannot accept it as the sole cause.

The etiology of renal calculus is shrouded in obscurity. The various physiological and pathological conditions which are capable of producing changes in the chemistry of the urine, in its solvent properties, its reaction, and in the amount and the character of its chemical constituents, depend so intimately upon a minute knowledge of general tissue metabolism and the derangements thereof, that it would be impossible to formulate and discuss them. No one as yet can say with authority that the primary reason for the formation of a stone depends upon urinary changes, for alterations in the chemistry of the blood, or changes in the glomeruli, uriniferous tubule, straight tubule or kidney pelvis may be the cause. Break the continuity of any of these structures and you will have a condition favorable to the deposition of the urinary salts and the formation of urinary calculi.

Summing up our knowledge of the etiology of this condition we are compelled to admit, in view of the fact that so many theories may be advanced and disputed with equal following, that at best our knowledge at present is but theory.

It is a disease in which heredity seems to play some part; it is about as common in the female as in the male; apparently more common in middle life, probably due to the fact that there are more people of that age, together with its easier recognition at that period. A residence in certain countries seems to favor nephrolithiasis, as is evidenced by its fre-

quency in certain localities; as along the Nile, Norfolk, Moscow, Scotland, etc. So far as I am aware no particular locality in this country suffers more than another, but the existence of stone in the kidney is far from an uncommon condition, typical cases often coming into the hands of the general practitioner in a relatively fair proportion to other diseases met with in his practice.

The varieties of stone, classified according to their composition, may be said to consist of but six substances, named in the order of their frequency they are:

FIGURE 1.—Calculus Pyelonephritis—note stone imbedded in abscess cavity.

1. Uric acid stones, which are composed of free uric acid, acid sodium urate, or more rarely ammonium urate forms the nucleus of a large per cent of all cases, and is found most commonly in middle life, may be found as single or multiple stones, are yellow to reddish brown in color, hard in consistency and are found in acid urine.

2. Oxalate stones composed of calcium oxalate. This variety will be found most often after the fortieth year of age, are usually single, though they may be multiple, and also occur in acid urine. This variety is regarded as the hardest type of stone, is more irregular in its form and produces severer symptoms and pathology.

3. Phosphatic stones are composed principally of phosphates of calcium, magnesium and calcium carbonate. They are the softest variety, more or less earthy, are chalky and crumble easily, with great liability to leave behind small particles in our efforts at removal. It is this variety that is found so often in the chronic suppurative cases.

4. Mixed stones, which are composed of layers of varying composition and may be found accompanying any of the former conditions or alone, whilst;

5. and 6 composed of cystin and xanthin are very rare. Another rare variety may be mentioned, which are described as fibrinous calculi, due to the excess of fibrin and the small amount of calcium entering into their composition. The chemistry of this condition is exceedingly interesting from a scientific standpoint, but to the practical physician not of much import, though a knowledge of the composition is essential to the proper after care of these cases.

The size and number of stones are of such great variations that it would be impossible to give them an intelligent classification; there may be one stone or dozens, and their size vary from a minute crystal or grain of sand to a large stone weighing several ounces. Their shape usually bears a fairly definite relation to their composition; the uric acid stone being for the most part fairly regular with one or two spiculae, and as a rule do not attain to extra large size; while the oxalate of lime stones have roughened surfaces, grow very large and following the direction of least resistance, grow into portions of the kidney substance or downward into the ureter. The phosphatic varieties are also usually irregular and occurring in suppurative cases may fill an abscess cavity.

Stones exist with about equal frequency in each kidney, by some said to be more common in the right, due to anatomical reasons. In from 10 to 15 per cent of cases both kidneys are affected.

Pathology.—The presence of a stone in the kidney is always accompanied by more or less pathological change in the renal tissue, though this may be so slight as to produce no recognizable symptoms. The pathological changes varying, from the area of induration and atrophy around the zone of a minute calculus, to the extensive destruction of the entire renal parenchyma, either from suppuration, most usual, or, from atrophy following urinary obstruction plus hydronephrosis, rare.

Minute calculi lodged in the calyx or elsewhere simply produce a limited amount of irritation, with subsequent atrophy and induration in the immediate vicinity of the stone. Small calculi not fixed, but movable in the pelvis, especially if they are of the oxalate type with sharp spiculae, produce traumatic injury, resulting in hemorrhage, with an accompanying degree of inflammation of the pelvis, pyelitis, or of the kidney, nephritis. This variety of stone may occasionally occlude the ureter producing attacks of renal colic and a mild degree of retention, hydronephrosis; the kidney, depending upon whether the obstruction be complete or incomplete, becomes either a large multilocular cyst with atrophy and absorption of renal tissue, or infection occurs and an abscess forms. This may burrow in one of several directions, either through the loin, upward under the diaphragm, into the inguinal region, or through the pelvis where it may completely or incompletely empty itself through the ureter. When this infected mass of retained and decomposing urine is prevented from escape by calculus obstruction, or by the debris resulting, or by inflammatory changes in ureter or pelvis, then the condition of pyonephrosis with enlargement results, which, if acute, may rupture either through the capsule or pelvis into the peri-renal tissue, bowel or peritoneal cavity. The process, however, being usually a chronic one, nature has time in which to thicken her capsule and produce inflammatory adhesions and in this way further protect the retained mass of infected matter. This leads to absorption and constitutional effects will soon show themselves. It would hardly come within the scope of this paper to discuss the formation of vesical calculi; but it should not be forgotten that renal calculi passing to the bladder is of unquestionably great significance in the etiology of vesical stones. Beck says in a recent article upon the origin of vesical calculi, "I have no doubt that with the exception of extraordinary conditions, the embryonic stage of vesical calculus is in the kidney."

Remembering then, that a healthy kidney sooner or later becomes a diseased one when it harbors a stone, as well as the many conditions liable to arise as a result of such disease which surely lead to death, either from an interstitial sclerosis, hydronephrosis with its atrophic changes, suppurative pyelonephritis, carcinoma, sarcoma, ureteral obstruction and anuria; together with the intense suffering accompanying many of these conditions, it behooves us to make a more careful

search for stone in the kidney and to make a stronger plea for their removal when the diagnosis has been made. I am sure that many of us know of cases that are harboring stones, the diagnosis of which we are positive, and yet we have not fully impressed upon the individual the danger of delay.

Symptoms.—A kidney stone may pass after its formation, from the kidney to the bladder and produce no symptoms, or it may remain quiescent in the kidney for a longer or shorter interval. The statistics quoted by Doran and referred to by Douglas give an unusually large per cent of symptomless stones, in which out of 24 kidneys where stones were found post-mortem, only 11 complained of pain while 13 were without. While it is interesting from a scientific standpoint to study the statistics of various post-mortems, and while it really teaches us that stones are far more common than we formerly thought, still we are more interested in arriving at a correct diagnosis in those cases really presenting symptoms, who are applying to us for relief. The symptoms which attract our attention to the kidney and cause us first to suspect a stone are pain and blood in the urine. Either or both of these symptoms may be due to other conditions, therefore it is wise that we should at first suspect stone and try by subsequent examination to disprove it.

Pain.—This as a rule is present, it may be slight in character, but will usually be persistent, located in the costo-vertebral angle, and from its continued character may produce lateral flexion of the thorax. The kind and the character of the pain will depend upon the location of the stone and upon whether it is fixed or movable.

In the former, the pain is due to the irritation of the foreign body and the accompanying inflammation, which, limited to a small area, produces only a modicum of pain; if, however, it is loosely encapsulated or movable within the pelvis of the kidney it will produce pain varying from a constant aching in the costo-vertebral angle, to the acute agonizing and intense suffering from distention due to obstruction. If the calculus should pass from the pelvis into the ureter and become engaged, then the suffering becomes unbearable. When pain is located and confined to the immediate renal region it is said to be direct, and it is usually this dull aching or sharp lancinating pain that characterizes a stone fixed, or slightly movable within the kidney. It may appear as a simple stiffness or lameness in this region of the back and is often mistaken for lumbago by the careless observer. *Unilateral pain, continuous and lo-*

FIG. 2.—Uric Acid Calculus—symptoms of four years standing.

cated in the costo-vertebral angle, should excite a suspicion of stone. The abundant nerve supply to the kidney, and especially the spermatic plexus convey the pain from this organ, and such pains are usually designated as referred pains. These pains may travel in one of several directions, over the ilioinguinal and genito-crural to the genitals, inner side of the thigh and to the sole of the foot over the sciatic; it is rather rare to have this pain reflected along the iliohypogastric to the region of the gall bladder, but may occur and cause an error in diagnosis. Pain referred to the opposite kidney is no longer regarded as hav-

ing been sufficiently proved. A stone moving about in the pelvis of the kidney will usually give rise to both the direct and referred types, the latter usually being referred to the genitals, producing retraction of the testicle, and to the bladder exciting spasm of this organ. Should the stone pass into the ureter, the pain is due then to the contraction and spasm of this organ, and will differ by more intense vesical irritation from the movable stone in the pelvis. The attack may come on suddenly during severe effort, as lifting or horse back riding, or may occur at night in an effort to turn over, when the patient is awakened with intense and agonizing pain in the region of the kidney, referred along the ureter to the bladder, with spasm of this organ and frequent desire to urinate, retraction of the testicle with pain, and inflammation may occur; the paroxysm shoots down the back, groin and thigh, and being incomplete gives the sufferer but little rest, the pain becomes unbearable, they toss to and fro and cry for relief, the intervention of a mild degree of shock with vaso-motor stimulation of the sweat centers produce a free diaphoresis, vomiting usually occurs which gives but temporary relief, the intense pain, the desire to urinate, the passage of a few drops of highly colored urine often containing a few drops of blood, characterize a typical case of ureteral colic. With this array of symptoms the gastro-intestinal type may occur and complicate the picture, when vomiting is persistent, abdomen distended, muscular rigidity intense and obstinate constipation persistent. I have seen one case of this character when no less a distinguished surgeon than our beloved Dr. Douglas could not for a time decide whether or not the case was one of intestinal obstruction. These symptoms usually subside in from a few minutes to several days, the subsidence is usually as sudden as the beginning; the stone either passing into the bladder or back into the pelvis of the kidney. In the event of the latter, the patient, while free from the intense agonizing pain, will not get as complete relief as when it passes into the bladder, of which they are often conscious. One of several conditions may now appear; the pain may subside, as, when the ureteral obstruction is complete and hydro- or pyonephrosis result; the pain may continue in a moderate degree from lacerations of the ureter; or a recurrence of the pain from another stone take place. Complete anuria from reflex disturbance with the opposite kidney is also a possibility.

Hematuria.—This is a frequent but by no means a pathognomonic symptom, but taken together with a group of other symptoms is of much importance. The amount of blood is usually slight, and ordinary macroscopic examination of the urine is not sufficient to reveal it; with the microscope, however, we are usually able to find a few blood corpuscles, except in those cases where the calculus is fixed and surrounded by a zone of sclerotic kidney. If the calculus be of the oxalate type and loose in the pelvis of the kidney, the hemorrhage may be profuse, but is of short duration and subsides readily with rest in bed. Occasionally by cystoscopic examination blood may be seen issuing from the corresponding ureter, though ordinarily the quantity of blood is so small that it can only be detected by microscopical examination after the ureter has been catheterized.

Pus is a result of an inflammation of the pelvis or other structures of the kidney plus an infection, and when accompanied by a large amount of mucous, it is an indication of the existence of a stone in the pelvis, as well as the character of the stone, for rough stones excite the mucous membrane to excessive secretion. Harrison regards excessive amounts of mucous in the urine of children as indicative of stone, when blood and pus are absent. Pus occurring in pyelitis is quick to separate and settle from the acid urine in which it is passed. Microscopic quantities of pus, or granular corpuscles and epithelial scales entangled in mucous are indicative of stone and

if acccompanied by blood in any quantity, with renal pain and history of attacks preceding, the diagnosis of stone is justifiable. If there should still be a question, we should always resort to the X-ray, for in competent hands no surer method of diagnosis is known. It is unfortunate that competent radiographers are not more numerous, but from our inability to find them or from the excessive charges made by them, our patients are frequently deprived of this valuable means of diagnosis. We should therefore perfect our means of clinical diagnosis to the point where we need not rely upon the findings of the radiographer; and it is advised that if the radiograph prove negative, that it should be no contra-indication to surgical interference. By all means and under all circumstances have a radiograph made when possible, for it will not only confirm the diagnosis but will give valuable information as to the location of the stone. The negative findings of the X-ray should, however, not be given too much credence, for the fat of the patient, the quality of the stone, the skill of the operator and the ability to interpret the picture are all to be taken into consideration.

Differential Diagnosis.—From such conditions as lumbago, the bilateral pain, the absence of pus and blood in the urine, and the ready response to anti-rheumatic remedies are sufficient.

From tuberculosis a very careful examination will be required, for there are cases in which the colicky pains due to the passage of cheesy debris, pus and blood in the urine, certainly simulate stone. A careful scrutiny of the history, minute examination of other parts of the body for tubercular foci, the existence of fever, sweats and loss of weight, with an increase in the quantity of the urine voided, will furnish aid in separating these conditions. The finding of tubercle bacilli, or positive findings in inoculation tests will always suffice. Cystoscopic examination, where involvement of the vesical end of the ureter has occurred will reveal the typical changes taking place in that organ.

Gall-stones—the location of the pain, the upward and backward direction in which the pain is reflected, the existence of tumor over the gall bladder, and jaundice will usually suffice.

Appendicitis, tubal and ovarian disease, the location of the pain, the absence of reflected signs, urinary findings, increased leucocytosis, etc., should be sufficient, though the error has been made.

Displacements with Deitel's crises are not of difficult recognition. Affections of the urinary bladder may be eliminated by cystoscopic examination.

The girdle pain of ataxia may be mistaken with renal, but will be found with the Argyle-Robinson pupil, Romberg's symptom and absence of reflex. Malignancy and tumor are accompanied by a more profuse hematuria, cachexia, a different history and absence of urinary findings as in stone.

Treatment.—Prophylactic, palliative and surgical.

Prophylaxis is, of course, essential where the case has once been relieved either by the passage of the stone or by surgical interference; it should consist in a reduction in the quantity of the food taken and should be carefully selected, avoiding excesses in animal and other nitrogenous foods. Water is the best prophylactic remedy and all patients with a "diathesis" should be instructed to drink liberally.

Palliative treatment wil be required to relieve an attack of ureteral or renal colic. Hypodermics of morphia, hot poultices to the renal region, sitz baths, the drinking of hot water, injections of atropine, inhalation of chloroform, high saline enema, etc., may all be used until the attack has passed, when the stone should be located to determine whether it has passed into the bladder or dropped backward into the pelvis of the kidney. I cannot advise delay, but urge that the seriousness of

these conditions be frankly stated to the patient and then if they wish to manage their own lives in the usual erratic way, it is their privilege to do so.

Surgical Treatment.—It is only a question of time in all cases, no matter how ardently you have applied both prophylactic and palliative measures, until an infection occurs and then we are dealing with a pyelitis or nephritis plus stone; or any one of the several conditions mentioned, destructive in their nature to the kidney, or to life, may, and usually do, occur. It is essential therefore that a diagnosis be made before these conditions occur which complicate the surgical treatment and increase the operative mortality.

THE PATHOLOGY AND TREATMENT OF CHRONIC PROSTATITIS

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Our knowledge of chronic prostatitis dates back almost one hundred years, when Lognean in 1815 described chronic inflammation of the prostate as a complication of Gonorrhoea. For a good many years following, however, the prostate received very little attention. The ideas of the medical men of that time regarding affections of the prostate and seminal vesicles were much confused, the distinction betwen chronic prostatitis and chronic vesiculitis not being clearly understood. The first autopsy in which the prostate was carefully examined is supposed to have been performed by Verdier in 1838, and the distinction between the two affections was at least partially cleared up. Since that time we have had many distinguished workers in the prostatic field, among whom may be mentioned Thompson, Finger, Fuller, Guyon, Albarran, Oberlander and Casper. In recent years a great deal of work in this line has been done by Young, of Baltimore, and we are indebted to him for valuable additions to our knowledge of the subject. That chronic prostatitis is a much more common affection than was formerly supposed, is, I think, generally recognised and due no doubt to more exact methods of modern diagnosis. Rothschild in thirty autopsies on men dying from various causes, not referable to the prostate, found twenty-seven with chronic prostatitis and found 90 per cent. of all men examined sufferers from chronic prostatitis, and came to the conclusion that chronic prostatitis often exists when no urethritis is present. In forty-five cases he found no evidence of urethritis in fifteen. Young, Geraghty and Stevens made twenty-one autopsies on cases dying from various causes not referable to the prostate and found chronic prostatitis in fourteen. In nine of these fourteen no urethritis was present. In six of the twenty-one cases, chronic inflammation of the seminal vesicles was present. The percentage of cases of chronic prostatitis that follow the acute form is very hard to determine, and as a very large number are not the result or have anything to do with an acute attack, justifies its consideration as a separate entity. A careful study of the embryology of the prostate greatly elucidates the changes found in chronic prostatitis, as well as giving valuable clews to the treatment. About the third month of foetal life the prostate is represented by a slight thickening surrounding the primitive urethra, close to the vesical orifice and surrounding the lower ends of the Mullerian and Wolfian ducts which later are represented as the prostate utricle and ejaculatory ducts, respectively. This thickening is of mesoblastic tissue and later becomes differentiated, chiefly into involuntary muscle fibers. Shortly after this ring of mesoblastic tissue appears, epithelial buds or outgrowths are noticed growing outward from the primitive urethra, piercing this mesoblastic tissue and by repeated branching forms the glandular parenchyma or secreting structure of the gland. The prostate in foetal life is represented as two distinct lobes which gradually fuse, and during the process of fusion, embrace and enclose the urethra, the Mullerian and Wolfian ducts, but there is a certain distinctness, and to some extent these structures are morphologically separate, a fortunate provision of nature for the prostatic surgeon. The development of the prostate seems to have some connection with the development of the testicles and the sexual nature of the male. In one case I examined; a man of thirty years, the testicles were no larger than an

infant's, the prostate was diminutive in size and still retained its primitive form. This patient was able to copulate, but was effeminate in speech and appearance and lacked the characteristics of a normal male. The glandular structure of each primitive lobe is entirely separate and the excretory ducts from the right and left lobe open upon the right and left side of the urethral crest, respectively. A fact that is borne out by a study of many cases of chronic prostatitis in which one side was comparatively healthy and the other was the seat of marked inflammatory lesions. The glandular structure is made up of about thirty distinct tube systems, about fifteen to each lobe. These tube systems are of the tubo-alveolar type and are each drained by a single independent duct. That these tube systems are entirely separate and independent of each other is another fact easily demonstrated by the frequency with which we find separate discrete nodulation in the gland which represents a tube system in a state of chronic inflammation. Each tube system drains into the prostatic urethra by a long narrow wavy duct, which for the last centimeter of its course is not branched, and therein lies the most potent reason why chronic prostatitis lasts so long and is in many cases so hard to cure and why occlusion of these ducts is attended by so much destruction of the glandular parenchyma.

Etiology.

The etiology of chronic prostatitis covers a wide range of causes, but may be grouped in two main classes.

First, those cases due primarily to infection of which the gonococcus is, of course, the most common type, but unclean instruments, catheters, etc., also play a very important role. Cases arising during the course of systemic infections are relatively infrequent.

Second, those cases due primarily to chronic congestion of the gland, incident to sexual excess, prolonged ungratified sexual excitement, masturbation, etc. In these latter cases infection with various bacteria is only a matter of time as the congestion lowers the natural resistance and prepares a suitable soil for the development of various organisms. We know that the anterior urethra harbors many bacteria in the normal state, but the posterior urethra is normally free from micro-organisms. The infection probably proceeds from the anterior urethra to the congested posterior urethra and soon finds its way into the prostate. Just what bearing the blood and lymph vessels have as avenues through which infective organisms are carried in these cases, is not entirely clear, but that infection in this way is possible is not doubted. There is one ultimate difference, however, between the Gonococcus cases and the cases due primarily to other causes and that is, the Gonococcus cases last longer, are harder to cure and are characterized by more extensive destruction of the glandular parenchyma, due probably to the more severe grade of inflammation and also to the toxin elaborated by the Gonococcus. Theoretically we might classify chronic prostatitis as catarrhal, follicular, parenchymatous, interstitial, etc., but as such a distinction is not always recognisable clinically, it is not of practical importance. Moreover, we frequently find changes characteristic of all these different phases of inflammation in different parts of the gland at the same time. There are certain cardinal principles in inflammation of the prostate gland which do not differ from inflammation in other structures. We must bear in mind the phenomena associated with the life history and capabilities of the different types of cells, especially as regards their degeneration, regeneration and hyperplasia; being careful to base our ideas and conclusions on established pathological facts in this regard. In the mildest type of cases we find the inflammatory processes involving the terminal excretory ducts at their entrance to the ure-

thra. As these ducts are of small calibre and are not branched during the last centimeter of their course they easily become occluded by desquamated epithelium, leucocytes, etc., and their lumen decreased by the oedema produced by the inflammatory processes in their walls. Following the occlusion of these excretory ducts by the inflammatory process we get a distention of the entire tube system thus drained and from the pressure of the retained secretion and also from the toxins elaborated by the bacteria present, an albuminous degeneration of the secretory epithelium or glandular parenchyma is produced. Sections made from prostates at this stage show a glandular condition of the cytoplasm of the epithelial cells, the nuclei staining poorly or not at all and the cells lacking their clear-cut distinctness. If under favorable circumstances the excretory duct again becomes free and open and the retained products evacuated, the glandular parenchyma may be reproduced providing there remains some epithelial cells that are at least fairly normal. The subject of cell regeneration as far as epithelial structures are concerned, is, I think, pretty definitely settled. Epithelial cells grow only from previously existing and fairly normal cells of the same type. If, however, the inflammatory process has progressed to the point where the glandular parenchyma is entirely destroyed and distinct pathological changes have taken place in the periglandular tissue, characterized by hyperaemia, transmigration of leucocytes, exudation of serum, proliferation of fixed connective tissue cells, etc. In short, the changes typical of exudative inflammation, then repair of the destroyed glandular parenchyma is impossible. A condition of replacement hyperplasia now obtains, marked by disappearance of the normal parenchyma cells, and in their stead a new growth of connective tissue due to proliferation of the fixed connective cells of the part and marked round celled infiltration. Whether the endothelial cells of the capillaries and the so-called "plasma" cells have anything to do with this new growth of connective tissue is not definitely settled. This new growth of connective tissue follows the usual characteristics of such tissue, and as time goes on contracts and shrinks and intercellular fibrillae appear and finally a condition of fibrosis and later sclerosis obtains.

Microscopical sections show in place of acini, and ducts with their beautiful clear-cut epithelial cells and bright staining nuclei, only bands of connective tissue and much round celled infiltration and here and there a dilated acinus, changing and distorting the entire picture. It has been claimed that a glandular hyperplasia is sometimes associated with the connective tissue hyperplasia. I do not believe this to be true. When we examine sections, under the microscope, from a perfectly normal prostate, we frequently see what looks like a glandular hyperplasia, but is really the normal structure of the gland. "The tubules of the gland are normally beset with numerous diverticuli, both simple and compound, that give the canal an irregular lumen and constitute what has been termed the duct alveoli, as distinguished from the terminal alveoli, the latter forming a series of irregularly branched tubular and saccular spaces, lined with a single or imperfectly double layer of columnar epithelial cells" (Piersol). It will be easily seen that a section taken obliquely to the direction of these ducts with the diverticuli, etc., above mentioned might give a picture that would look very much like a glandular hyperplasia. It will be noticed in the normal prostate that the three chief structures are represented about as follows, viz.: Glandular 50 per cent, muscular and connective tissue, of each about 25 per cent. In chronic prostatitis the only structure increased in amount is the connective tissue. That chronic prostatitis stands in a causative relation to either glandular or myomatous hyperplasia, which for

want of a better term we call hypertrophy, has not as yet been proven. When we consider the pathological changes found in chronic prostatitis and consider that in many cases, one or many of these tube systems becomes virtually transformed into an abcess cavity which may continue as a suppurating focus for a long time, and later be transformed into a mass of cicatricial tissue, it seems hardly possible that we can expect a complete cure in all our cases, and leads us to believe that the many optimistic reports appearing of late, regarding the administration of Gonococcic vaccine and serum, must have been in cases that were comparatively mild in type and not characterized by any great destruction of the glandular parenchyma.

Treatment.

The successful treatment of chronic prostatitis is sometimes one of the most difficult problems confronting the urologist. In addition to the destructive changes that have taken place in the gland, we frequently have the added picture of a nervous, broken down patient, either markedly neurasthenic or hypochrondriacal, two types which should not be confounded, the first based on a distinct pathological foundation, the latter a perverted mentality. It goes without saying that the physician should manifest and actually have a sufficient kindly interest in each patient that will gain his entire confidence.

To succeed with these cases means that we must have the co-operation of the patient, and this we cannot have unless we possess his entire confidence. The treatment resolves itself into general and local treatment. The general treatment should include the adoption of a systematic plan, regulated by the needs of each individual patient to improve his morals as well as his general health. Aside from the regulation of the patient's bowels, which is important, drugs are seldom necessary. The time-honored injunction to give our neurasthenics Iron, Quinine, and Strychnine is already "hoary with age," and mentioned only out of respect. Definite instructions should be given as to sleeping and drinking and eating, avoiding especially excesses in both eating and drinking. These patients should have a plain unstimulating diet, and as far as possible, avoid spiritous and malt liquors. Alcohol and tobacco may not hurt some of these patients, but alcohol especially does none of them any good and some of them a great deal of harm by its pernicious influence on the nervous system. Physical culture and gymnasium practice works wonders for some of these patients, and combined with baths improves the mental, as well as the physical conditions. An occasional Turkish or Russian bath or salt rub is very beneficial. Swimming is an excellent exercise to strengthen the perineal muscles as well as for the benefit of the hydrotherapeusis. In all cases in which there is a loss of diminution of the patient's sexual powers, avoidance of all sexual excitation is imperatively demanded, and the necessity of excluding all sexual thoughts from the mind should be impressed on the patient. There are cases, however, in which the grade of pathological condition is mild, and in which the sexual powers are not interfered with that a moderate indulgence in coitus under normal conditions and in normal amount is really beneficial.

Local Treatment.

Abnormal conditions, such as stricture, calculus, chronic urethritis, etc., are of course to be treated either before or concurrent with the chronic prostatitis. The most valuable treatment is massage. I believe with Casper, of Berlin, and Young, of Baltimore, that as regards massage, it is paramount to all other treatment in chronic prostatitis. When I say massage, I do not refer to that procedure known as vibratory masage. In the original Greek the word massage means "to knead," and that is just exactly what I think it should mean, as applied to massage of the prostate.

Everyone who has treated patients who "have been the rounds" of different physicians for this malady, will agree with me, I think, when I say that there is a wide divergence of opinion in the minds of different medical men as to the modus operandi and utility of this procedure. There are two objects to be accomplished in massage of the prostate. The first one is a thorough emptying of all the pathological products contained in the ducts and acini of the gland. The second is the production of an artificial hyperaemia which stimulates the sluggish circulation in both blood and lymph vessels, which in these cases are always in a state of chronic passive congestion, aiding in the dissolution and absorption of pathological products, restoring tone to the vessel walls and to the muscular structure as well. If the prostate is massaged properly and the first object is successfully accomplished, we can rest assured that the second object will also be obtained.

METHOD.

The first essential is to have the patient in a position in which the prostate is most accessible to the examining finger. This is best accomplished by having the patient stand with his feet slightly separated, his elbows on his knees and his knee joints, not flexed, but having his legs straight at the knees. The operator, seated, can then introduce the right forefinger, covered with a cot, and well lubricated with plain or carbolated vaseline and with the left hand grasp the patient's shoulder. This gives the operator complete control of the situation. The prostate having been carefully mapped out by sweeping the finger over the accessible surface of the gland, noting carefully the size, consistency, tenderness, nodulation, in fact any abnormality present. The seminal vesicles should now be examined by inserting the finger as high as possible, noting also their abnormalities as to size, tenderness, nodulation, etc. In chronic inflammatory conditions we can often feel the lower ends of the vasa deferentia and we frequently find an area of induration at the point where the seminal vesicles join the vasa deferentia, where they sink into the substance of the prostate as the ejaculatory ducts. Of course, in many cases these structure cannot always be felt. But in those in which the original infection has invaded the ejaculatory ducts and traveled up into the seminal vesicles and vasa deferentia and the inflammatory process continued for a long time until distinct pathological conditions have resulted, they are then easily recognisable and must not be overlooked in the process of massage. Massage of these structures is often quite difficult and requires considerable effort on the part of operator, but it is absolutely essential to bring about a cure. After the operator has carefully sized up the situation, which should not be done hurriedly, for fear of missing important details, he now proceeds to massage the prostate in such a maner as will accomplish the first object as noted above, viz: a thorough emptying of all the pathological products contained in the acini and ducts of the gland. In doing this it is well to remember that the integrity of the rectal mucosa is to be carefully preserved and must not be rubbed or otherwise injured by the massaging finger. In place of sliding the finger over the rectal mucosa, it should as far as possible move with the finger. Starting our manipulation at the median line gradually work outward and up toward the seminal vesicles on each side. The time to be consumed should not be longer than is consistent with thoroughness, but will require several minutes.

When we consider that the true capsule of the prostate is quite tough, and besides that the prostate is invested by a very strong fascia which is reflected from the pelvic fascia along the arcus tendineus, called the fascia endopelvina, sometimes called the fascia of Denonvilliers, and considering the nature of all the structures with which we have to deal, we can hardly expect to accomplish much without

real actual pressure. Following the massage a copius urethro-vesical irrigation is absolutely necessary, and under no circumstances to be omitted. Unless this is followed out we will sometimes find that bacteria that have lain dormant in the prostate will set up urethritis and often cystitis or bacteriuria. The fluid used for irrigation may be either warm, sterile, normal salt solution, potassium permanganate 1 to 6000, or hg. bichlor. 1 to 60,000 or silver nitrate, 1 to 10,000. In making up these solutions it is absolutely necessary to use sterile water, not tap water, sterile irrigators and tips that are boiled for each patient. The interval between the treatments is a matter of some importance. No rule is applicable to all cases, but twice a week is a general average. Overtreatment is to be avoided for its unfavorable effect of causing too much irritation as well as directing the patient's mind too much to his trouble. In many cases once a week is sufficient, and produces very satisfactory results. Dilatation of the posterior urethra once a week, or at least not oftener than once in four or five days, with a Kohlman dilator, or a large sound, is very beneficial in reducing the hypersensibility of the urethra, as well as assisting in the absorption of the sub-mucous infiltration and the infiltration around the terminal excretory ducts, and does for the urethra what massage does for the prostate. The degree of dilatation should be suited to each case, and varies between 30 and 40 F. Excessive dilatation carried on too long is harmful and should be avoided. I seldom dilate over 35 F. Hot rectal irrigations are sometimes of value, and not to be overlooked, but it is not always easy to get patients to carry out this procedure sufficiently to produce tangible results. As to the injection of gonococcic vaccine and serum, the optimistic reports of some writers have been more than counterbalanced by the adverse reports of others. Personally I have seen no permanent benefit from vaccine and serum in chronic prostatitis. There are several obstacles in the way of serum and vaccine therapy in this disease. In the first place it is necessary to have the serum or vaccine that represents the offending organism. Several years ago Porosz emphasized the infrequency of the gonococcus in chronic prostatitis. Notthaft states that Neisler, Putzler, Finger, and Walsh accept the persistence of the gonococcus in the prostate for one year. Other writers (Schram, Judassohn, Ruggles, and Goldberg) attach great significance to mixed and secondary infections. Notthaft, in a study of 120 cases of chronic prostatitis, found the gonococcus in only 9.5 per cent. of cases that appeared within one year of the last gonorrhœal infection, and in no case at the end of the third year. As remarked before, the posterior urethra, in normal conditions, is free from bacteria, but in pathologic conditions many bacteria may be found. Tano found in the shreds of 30 cases of chronic posterior urethritis, 29 varieties of bacteria. However, bacteria in the posterior urethra do not necessarily invade the prostate, and for this reason the technique of the methods employed in the determination of the bacteriology of chronic prostatitis is a matter of scientific importance. Young, Geraghty, and Stevens, in a very careful bacteriological research of chronic prostatitis, in which precaution was taken to not have the prostatic secretion contaminated by any bacteria in the urethra, found in 17 patients no gonococci at all and in only 6 of the 17 cases any other bacteria. One of the 6 positive cases had never had gonorrhea. The other 5 cases had their last gonorrhœal infection from four months to 15 years prior to the examination. The bacteria found in these 6 positive cases were the staphylococcus albus, streptococcus pyogenes, and a bacillus (not identified). From the foregoing it will be seen that the presence of the gonococcus in chronic prostatitis after the first year is, in the majority of cases, unlikely. Even if

the gonococcus is present, the question of autogenous and stock vaccines confronts us. And if the gonococcus is absent we can hardly expect gonoccic vaccine or serum to benefit those cases of secondary infection in which the identity of the organisms present is so hard to determine.

CONCLUSIONS.

1. Chronic prostatitis is a more common affection than is generally supposed.

2. That manual massage with the finger, carefully and thoroughly performed, is the most valuable measure in the treatment.

3. That accompanying the massage, the "toilet" of the urethra and bladder is just as important as in a surgical operation.

4. That gonococcic vaccine and serum offers very little assistance in the therapy.

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MALARIA AS A CAUSE OF PURPURA HEMORRHAGICA.

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Purpura simplex is not of uncommon occurrence in malaria. Purpuric eruptions are also occasionally noted in hemoglobinuric fever. But when associated with genuine hemorrhages, constituting the true morbus maculosus Werlhoffii, it is exceedingly rare, so rare indeed that I am able to find mention of only half a dozen cases.

Eisenmann (1839), Wenmarning (1846), and Tchouprina (1897), are said to have seen such cases.[1]

Bastianelli and Bignami[2] report a case of chronic malaria complicated by Werlhoff's disease. In addition to severe cutaneous hemorrhages there was bleeding from the gums, ears, and nose. Estivo-autumnal parasites were found in the blood.

Hirtz and Bernheim[3] report a fatal case complicating chronic malaria. Besides the purpuric hemorrhages upon the skin and the mucous membranes of the lips, mouth and nose there was abundant epistaxis.

The case of Marchiafavo and Bignami[4] was in the person of a woman who was three months pregnant. After having suffered for two days with headache she was seized with bleeding at the nose, which, beginning as a slight oozing, constantly increased in quantity until she was in an extremely weak state. The skin, especially that of the neck, breast and abdomen, was covered with hemorrhages and bleeding from the gums and nose continued. The day after the bleeding began the temperature was 104°, the pulse small and frequent, the respiration hurried, the skin earthy in color, and the spleen a little enlarged. The blood contained an enormous number of unpigmented endoglobular parasites. Heroic doses of quinine were injected hypodermically. On the third day, notwithstanding the fever had fallen and the hemorrhage ceased, she miscarried. This was followed by hemiparesis of the right side, accompanied by partial aphasia, which was for the most part sensory. In about a month the patient recovered from this paralysis, but there remained for a long time a state of psychical weakness with great excitability and a group of symptoms recalling the phenomena of disseminated sclerosis. A complete cure was finally effected.

I have recently had the opportunity to observe a case. A brief history follows: Mrs. B., white, female, aged 22, married, nullipara, a native of West Virginia, has been living on a shanty boat in Eastern Arkansas for three years. The cause of her father's death is unknown; her mother died of heart disease. The patient had typhoid fever, complicated with pneumonia when a child, and has had chronic otitis media on the left side since babyhood. For about five years she has had chills during both summer and winter at intervals not exceeding one month. During the summer of 1907 while she was having a series of chills, purpuric spots appeared all over the body, and at the same time hemorrhages began to occur from the mouth and nose. The bleeding from the mouth was abundant, and during the night would saturate cloths placed under the head and soak through to the pillow. During the day she was constantly spitting blood. The epistaxis was not so profuse. As the malarial paroxysms would abate the hemorrhagic symptoms would gradually disappear to return again with the onset of the chills. The menstruation has been very irregular for the past few years, being sometimes scanty, at other times, especially when the purpuric symptoms were in evidence, excessive. When I first saw her on April 1, 1908, she has just recovered

from the effects of a hemorrhage from the mouth and nose sufficiently to make the trip to the office. She was pale and the abdomen distended so that she appeared to be about six months pregnant. The entire body was covered with petechiæ and ecchymoses, and petechiæ were to be seen upon the mucous membrane of the mouth; the tongue looked pale and anæmic. The pulse was 110 and very soft and compressible; the temperature was 97.5°. The first sound of the heart was scarcely audible. The spleen, which was very hard, reached beyond the umbilicus and to the anterior superior spinous process. The patient was very nervous and the lips and fingers trembled constantly. The appetite was irregular, the digestion poor, and the bowels constipated. There were no signs of rheumatism. The examination of the blood was negative for parasites; she had recently been taking "chill-tonic." The red cells numbered 3,950,000, the whites 7,900. There was an almost entire absence of platelets. The hemoglobin was estimater at 60% (Talquist). The differential leucocyte count was: Small mononuclears, 25%; large mononuclears, 14%; polymorphonuclears, 51%; eosinophiles, 10%. The treatment prescribed consisted of a teaspoonful every four hours of an elixir containing five grains of calcium chloride to the dram, besides an antimalarial tonic of strychnine, arsenic, iron and quinine. Within a week all purpuric spots had disappeared, excepting a large ecchymosis on the left forearm. On May 30, the hemoglobin was 100%, though the spleen was still considerably enlarged; she has had no chills nor purpuric symptoms up to this date, which is the longest interval free from chills she has enjoyed in several years.

Marchiafava and Bignami[5] call attention to the importance of differentiating these cases from acute leukemia. They saw a case of acute leukemia in a young girl who had purpuric skin with hemorrhages from the gums, stomach, genitals, and elsewhere, in which hemorrhagic malarial infection had been diagnosed on the strength of an irregular temperature and an enlarged spleen. The microscopic examination of the blood revealed the true condition.

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MALARIA, ITS PROPHYLAXIS AND TREATMENT.

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That malarial affections are on the increase, in certain localities, must be attributed to something more conclusive than to the mere improved methods by which it is distinguished from other allied affections. This increase became manifest long after the discovery of the plasmodium malariæ, which stamped its individuality, hence, indicating an absolute, and not relative increase. In suggesting tenable cause for this, the following factors, I believe, materially influence the conditions as they now exist. (1) Our more intimate intercourse with the tropics in general, and with our tropical possessions in particular. (2) The advent of the Spanish-American war. (3) The Panama Canal Operations. (4) The increased transportation facilities, dependent upon ever-progressive commerce. These we shall consider seriatim.

Our more intimate communication with the tropics is but the natural result of the economic law of demand and supply, and effect us only in so far as the increased number of vessels making port along our coasts, and infectible port towns, bring with them the anapholes, and passengers infected with the hemameba, through the agency of the mosquito, acting as the definitive host, and cause of blood parasite. Confirmatory of these remarks, I refer to reports by A. H. Doty[1], Health Officer of the port of New York; S. B. Grubbs[2], Past Assistant Surgeon U. S. P. H. & M.-H. H.; Juan Guiteras[3]; L. O. Howard[4]; H. R. Carter[5], and Walter Wyman[6]. While these reports are written more in reference to the stegomyia, and yellow fever, they serve to show what might be done in the case of the anapholes and malarial fever.

Craig[7] makes the following observation: "Of 1,267 soldiers ill of various diseases, and returning from the Philippines, found that 25 per cent. of them showed malarial parasites in their blood, unaccompanied by clinical symptoms of some other diseases. Randolph[8] points out that the increasing intercourse between the United States and foreign malarial-infected regions, especially by Government officials, may lead to increasing number of cases offering the characteristics of tropical malaria.

The advent of the Spanish-American war served to furnish us with many infected mediums, to complete the life-cycle in places where the anapholes abound. Forchheimer says, "In certain parts of this country, where anapholes exist, and malarial diseases had practically disappeared, the latter again became endemic upon the return home from the Spanish-American war of soldiers who had malaria. This accords with my own observation while mustering out hundreds of soldiers at the close of the Spanish-American war. Many of the soldiers showed distinct evidences of malarial infection, and failing to eradicate same no doubt started afresh endemics."

The Panama Canal operations have not only largely contributed to the mortuary statistics of the United States, but has, in no small way, been represented in infectible localities. However, by indefatigable energy and an exact knowledge of the requirements of the situation as they existed, the sanitarians so lowered the death rate of the canal zone as to challenge that of many of our progressive cities.

Increased transportation facilities furnish us with sanitary problems of a more personal nature, dealing, as it does, principally with our railroads, and water-crafts, plying in small streams.

Railroads not only transport infected people to infectible localities, but convey as well anapholes to unfected localities, giving rise to new foci of malarial infection. To convince one of the truth of this statement it is only necessary to watch the swarms of mosquitoes that enter coaches while stopping at some station located in the swamps. These mosquitoes are distributed along the entire railroad system.

One of the greatest contributors to mosquito-breeding places is to be found in the continuous ditches on each side of railroad beds. These ditches are always filled with stagnant water, and generously "stocked" with mosquitoes by freight and passenger trains. A correction of this insanitary oversight insisted upon by the Railroad Commissioners would go farther than any other one measure towards the extermination of mosquitoes in certain inland towns, and should meet with the approval of all health officers.

The life-cycle of the mosquito being established, admits of absolute laws for prophylaxis, of which we shall treat directly, as it is not the purpose of this paper to deal with the habits and morphology of the parasite.

Prophylaxis can be conveniently summed up under the following heads: (1) Prophylactic measures directed towards the destruction of the mosquito and their larvæ; (2) Prevention of the parasite gaining entrance into the human body: (3) Increasing the resistance of the human body to the parasite. (Marchiafa and Bignami.)

It will be convenient to divide prophylaxis into that as relates to towns and premises. Sanitary problems presenting themselves along certain coasts, and in districts where swamps abound, shall be relegated to the engineering skill of the Government, State, and municipality. Through these departments many miles of boggy swamps have been reclaimed by suitable draining and "filling in." River banks have been trimmed so as to no longer hold overflow water, and their beds narrowed in order to increase the current. Small lakes and ponds, which for certain reasons cannot be drained by ditching, may be emptied by sinking deep wells in their bottoms. That this did not prove a success in our city (Montgomery) was due to wells becoming stopped with mud and trash. This could be obviated by covering openings to wells with croker-sacks. Such places that cannot be drained should be oiled. The oil not only inhibits larval life, but kills many female mosquitoes that light on the surface of the water for the purpose of depositing their eggs. The oil must be applied once in two or three weeks, and the grade known as "fuel oil" is well suited for the purpose.

It is at times not desirable to drain certain ponds, or pools, but in which mosquitoes breed abundantly. For this purpose Mr. W. P. Seal[9] of the Aquarium Supply Co., of Delair, N. J., recommends the top-minnow (fundalus notatus.) These minnows are very destructive to larva, and in sufficient numbers will keep the water free from "wigglers."

Prophylaxis of towns to be effectual must comprise the concerted action of sanitary department and individual citizens. Suitable ordinances should be directed towards the extermination of mosquitoes, which may be accomplished by destroying their breeding places. These will generally be found in such places as leaking hydrants, and "shut-offs," unused wells, and cisterns, various receptacles about the yards, notably among which we might mention vessels in chicken coops, watering troughs, barrels placed under gutters, and under-hanging gutters themselves, also trees with knot-holes in them. It is generally the fact of these trees with knot-holes in them holding water, that causes a shady town to be known as a malarial town.

Prophylaxis of premises includes that of outdoors and indoors. Indoor prophylaxis is to begin with suitable screening, meshes of screens not to exceed 1-18 or 1-16 of an inch.

The 1-12 is too large to inhibit passage. Do

not forget to stop openings to fire places, as mosquitoes may enter the house down the chimney.

The most effective way of killing the mosquito, when they are too numerous to be killed as individuals, as when seen resting on screens, walls, etc., is by fumigation. Sulphur and formaldehyde are the agents usually selected, however, pyrethrum is of some service—not being so penetrating, and the fumes not so lasting—but is open to the objection of not always killing the mosquito, but merely stunning them, and upon admitting fresh air into the room, all mosquitoes not gathered at the time may become resusciatated. "Culecide," which is a mixture of equal parts of gum camphor and crystal phenol brought into permanent solution by aid of gentle heat was extensively used in the yellow fever epidemic of 1897. The mixture is placed in a vessel with tall sides in order to prevent its coming in contact with the flame—as it is inflammable. Two ounces had better be used for each 1,000 cubic feet. Its lethal effect is about the same as that of pyrethrum with the disadvantage of being expensive, and not altogether devoid of danger.

The mosquitoes being destroyed, it is now necessary to prevent the hatching of eggs by emptying all vessels holding stagnant water. Those most likely to escape our attention being vases, cuspidors, bottles, jugs, unused traps to water closets, and especially vessels put under table legs and safes. As these latter are intended to hold water it is necessary to oil them.

Preventing malarial parasites gaining entrance into the human body is well-nigh impossible in certain localities. Success in preventing infection is in direct proportion to one's vigilance, and is influenced by environment. In a general way we might suggest a change of residence, in some instances merely from one part of a town to another, as the mosquito seldom makes long excursions. Remain indoors after dark; however, it must be borne in mind that *our brilliant electric lights might make some change in the nocturnal habits of the anapholes,* causing them to venture out in the daytime. It may become necessary to sleep under mosquito netting even though the house be screened, as it is not at all unlikely that a few stragglers will find their way in, and should they be "loaded," are infectious.

Many ill-savored lotions are placed on the market, which it is claimed prevent mosquito bites, and a cure for same should they bite notwithstanding. These lotions usually consist of certain essential oils, such as pennyroyal, citronel, and lavender, dissolved in alcohol. I do not believe they accomplish the end for which they are intended, as they only hold at bay the mosquito until the lotion evaporates, thereby merely delaying the assault for a time sufficient to procure sleep.

A piece of personal prophylaxis of great importance to the physician consists in avoiding the bites of mosquitoes found about the bedside of patients infected with malaria. The attending physician may succeed in preventing their bites on hand, face, neck, and head, should he be short of hair, but while his attention is directed to the patient, such mosquitoes as lurk under the bed—and this is a favorite place for the anapholes—viciously attack the ankles. I have at last learned the hard lesson of wearing, all the summer, high-top shoes.

Treatment.—As soon as malarial parasites are found in the blood, or as soon as a diagnosis of malarial fever has been made, the patient is to be put to bed, under mosquito netting, the same as in case of yellow fever, and required to remain there at night, at least throughout period of convalescence. This is a matter of importance, for not only may the mosquitoes become infected and convey the disease to others, but may reinfect the patient by having fed on his blood in previous weeks when same was filled with parasites.

If patient is seen at time of chill, much can

be done for his comfort by administering spts. chloroform, or some hot diffusible stimulant, by the application of external heat, and with sinapisms prudently placed.

A mercurial purge, followed by some saline, is in most instances indicated. The doses of calomel as suggested by many authors are inadequate for this climate, therefore such doses as 1-8, 1-2, or 1 grain should not be prescribed, except in case of infants or young children, as they do not reach the liver. For remittent malarial fever larger doses of calomel are advised, say from 5 to 15 grains to be given in one, or divided, doses. I have seen a remittent malarial fever with a temperature only partially influenced, after repeated and full doses of quinine, and running a course strikingly like that of typhoid fever, make appreciable drops upon giving additional doses of calomel. This is a noticeable feature of accompanying charts, and seems to be a *sine qua non* in more speedily terminating the disease.

Quinine being the exact chemical limitant of the action of the causative parasite, is specific. Its action is most effective when sporulation has taken place into the plasma of the blood, therefore its maximum effect should be obtained at this time. If this is reckoned in the intermittent form of malarial fever, quite small doses of quinine are sufficient to rob a fever chart of much of its symmetry; however, in the remittent type of malaria larger doses are required, and the drug should be given at three-hour intervals throughout the twenty-four hours. Frequent causes of failure to cure the patient is due to the *omission of the drug at night.*

The dose of quinine to be prescribed depends upon the alkaloidal strength of the salt selected; upon the condition for which it is to be

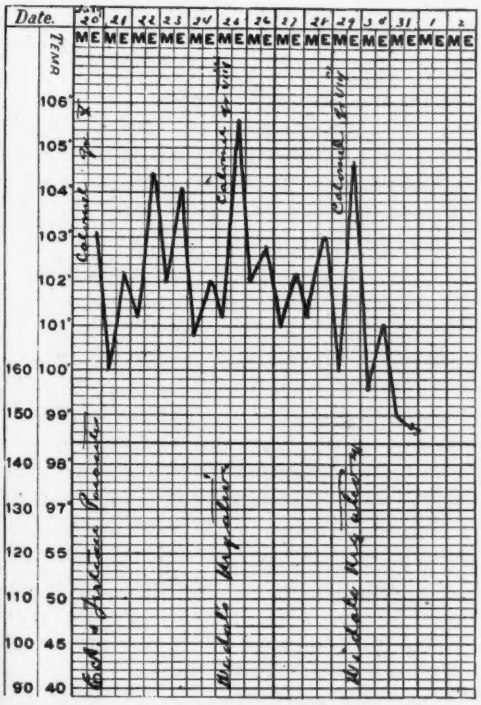

FIGURE 1.

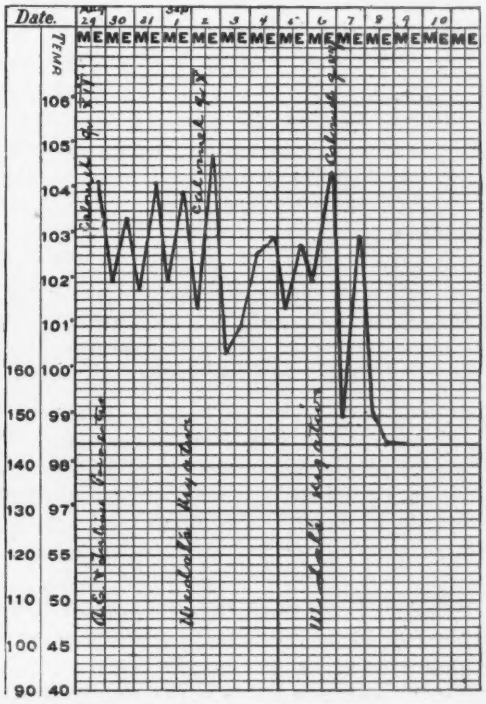

FIGURE 2.

used; and upon the method by which it is used. From experiments performed, based upon observations of fresh water amebas, it was predicted that the concentration of quinine of 1-5000 in the blood would inhibit ameboid movement of parasites and by estimating the total weight of the blood in the body the required amount of quinine could be foretold. The amount of blood in an individual weighing 130 lbs., was estimated to weigh 5,000 gms. (13.5 lbs.) The required amount of quinine, therefore, to make a blood dilution of 1-5000 would be 1gm. (15.5 grs.)

Hypodermic injections of quinine, I am sure, are not used as generally as their importance demand. Abscess formation has been a great obstacle to their use, and yet they need not occur, if technique is conformed to aseptic teachings, and the injections made deep into the muscle tissues. For these injections the compound salt of quinine hydrochloride and urea is convenient to use, as it is soluble in its own weight of water, and the irritation but slight. Laverans suggests the following formula as being very effective, and its injection painless. Rx. quin. hydrochlor. grs. viiss; antipyrine, grs. v; distilled water, m. xv. The ordinary hypodermic syringe is frequently too small for these injections, therefore, the antitoxine, or "Sub Q.," syringe may be used. Intravenous injections may most satisfactorily be made by introducing the point of the needle *directly into the vein,* which is to be made as prominent as possible by constriction from above. Bacelli suggests the following formula. Rx. quin. hydrochlor. grs. xv.; sodium chlor. grs. XII.; distilled water, drs. iiss. The solution to be given warmed. Hypodermoclyses when indicated, may also contain quinine in solution. Ten to fifteen grains of the hydrobromide, or hydrochloride, being generally used. Loss of tissue is not infrequent, especially if too much tension is caused. Enteroclyses have been suggested when quinine cannot be given by mouth, however, they should have no place in the treatment of malarial affections, as the hypodermic injections are much more satisfactory, and less objectional. The bowel soon becomes intolerant, therefore only in cases of amebic dysentery should quinine be exhibited by the bowels. Suppositories are restricted in their use for same reasons as that of enteroclyses. Some authors stating that none of the quinine is absorbed. Certain pediatrists have suggested that suppositories be used combined with a little opium and belladonna, and that the nurse be instructed to compress the buttocks for half an hour after the insertion of the suppository into the bowel. Innunctions have but few who are willing to acknowledge any effect of quinine exhibited according to this method, however, I fail to see why a soluble salt of quinine, when incorporated with lanolin and lard should be more impossible of absorption when rubbed into a thin skin of an infant or young child, than is mercury, the iodides, salicylate, chloral, etc. I bear willing testimony as to the efficacy of the following formula: Rx. Quin. hydrochlor. (or bisulfate), grs., xl.; lanolin and lard, of each oz. 1. If paroxysms of malarial fever were not cut short by this mode of administering quinine in certain infants, then these cases are striking instances of autotherapy, or of "post hoc ergo propter hoc." The fact that the amount of quinine absorbed is uncertain should be no bar to its use, for the same objection holds good for all inunctions.

Malarial cachexia may or may not, respond to quinine therapy, however, it is certain that the quinine should be extended over a longer period of time, and had better be combined with arsenic, iron, and strychnine. These patients, as a rule, make quicker recoveries when sent to an elevation of from 2,000 to 3,000 feet.

Hemaglobinuria, or black-water fever, has given occasion for a greater diversity of opinion, as to its cause and treatment than any other syndrome. T. W. Jackson[10] says: "I hesitate to do more than describe it." McCay[11]

suggests that the hemolysis is due to injury of stroma of red blood cells by malarial parasites, also to the administration of sulfates. He suggests, in way of treatment, that only the hydrochloride of quinine be administered in regions where black-water fever is prevalent. Forchheimer[12] states: "When hemoglobinuria occurs in a patient with malarial parasites, without quinine having been given, quinine frequently cures both the malaria and hemoglobinuria. When the hemoglobinuria occurs after an attack of malaria, the parasites being absent, quinine should not be used, for it does no good and usually even does harm. If in a malarial attack the administration of quinine is followed by hemoglobinuria, *i. e.*, during the time of its maximal physiologic effect, the quinine should be withheld, as it seems to be shown that the drug is acting directly as proximal cause." My own observation has been that many of these cases develop without the intervention of quinine and disappear without the aid of quinine.

In the treatment of other diseases a possibility of the clinical course being modified by a concomitant sub-stratum of malaria, should always be borne in mind. The diseases most frequently associated with malaria are tonsilitis, bronchitis, pneumonia, typhoid fever[13], enterocolitis, and with chronic diarrhœa. I have seen patients with tuberculosis whose afternoon rise of fever was due to malaria instead of the tubercle bacilli. Skin affections are influenced by a concomitant malaria, as so often seen in case of erysipelas, psoriasis, impetigo, and urticaria. Many of the more trivial symptoms that harass mankind are chargeable to malaria, as headache, biliousness, general malaise, indigestion, cramps, myalgia, etc. It is also frequently responsible for neuralgia as supra-orbital, intercostal, sciatica, etc., and causes all manner of nervous manifestations ranging in severity from mere nervousness, to that of neurasthenia, hysteria, and dementia.

In reckoning pathology we are also to credit malaria with causing structural changes in the internal organs, such as is found in the kidneys, liver and spleen.

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ANAESTHESIA, DEDUCTIONS FROM ONE THOUSAND CASES.

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It is well in some things to follow the motto of the Sun Dial: "I record only the hours of sunshine," but in medicine if one is honest with himself and his profession he will also record the hours of darkness.

Within the past five years I have given over one thousand anaesthetics, and I am glad to say, that I cannot record one case that died as the result of anaesthesia alone. Unfortunately, however, I have had the sad experience of witnessing the death of two patients in my own practice and three in the practice of my colleagues.

Case A. Ether anaesthesia: A child six years of age suffering from diffuse septic peritonitis produced by a perforating appendicitis, was prepared for operation. His temperature was subnormal, abdomen tympanetic, respiration embarrassed, and his pulse had disappeared. He was placed upon the table in a moribund condition. His abdomen was opened, the apendix removed, and a thorough peritoneal toilet made. Soon after closure of the abdominal wound was begun his pupils dilated, he gave a few gasps, expelled a round worm from his mouth and died.

Case B. Ether anaesthesia: A white woman forty-five years of age had suffered from recurrent carcinoma of the right breast for several months. She was cachectic and her general condition very bad. An interscapulo-humeral amputation was attempted. Great difficulty was experienced in ligating the subclavian artery, she lost much blood, and after one hour of anaesthesia she died of shock. I am willing to assume the responsibility of these deaths, but do not think they should be credited against the anaesthetic.

It will probably not be irrevelent to mention three other cases which I have seen occurring in the practice of other men.

Case 1. Chloroform anaesthesia: A white male about forty-five years of age had suffered from gall stones for many years. Anaesthesia was begun and without previous warning the patient died suddenly while the abdominal incision was being made. The operation was completed post-mortem, and a gallstone occupying the entire bladder was removed. Cardiac and respiratory paralysis occurred synchronously. A thoroughly competent anaesthetist was administering the anaesthetic, and we must record the death of this patient against chloroform.

Case 2. Ether anaesthesia: A young negress with a very large ovarian cyst was anaesthetized. Just as the operation was begun she began to do badly and was immediately placed in the Trendelenberg position. In my opinion this was exactly what should not have been done, for, I am sure, the pressure of the cyst, indirectly, upon the diaphragm prevented resuscitation. I do not think we can justly credit this death to the anaesthetic, but must, at least, place part of the burden upon the faulty technique of resuscitation.

Case 3. Nitrous Oxide Anaesthesia: A healthy white woman about thirty years of age was given nitrous oxide for the purpose of extracting a tooth, and died in the dental chair. I saw this patient immediately after death and cannot say what was the cause.

Actions of Anaesthetics: Wagner and Hans Myer have proven that all narcotics act by combining with the lechiten and cholesterine holding bodies of the lipoid cells in the brain producing changes which result in narcosis.

Post-anaesthetic effects of ether: Dacosta

and Kaltyer have found that the erythrocytes are increased on an average of 146,360 per cm., and that the hemoglobin index was increased an average of eight per cent. The leucocytes averaged 4,586 more after anaesthesia than before. This apparent improvement of the blood is no doubt due to blood concentration from purgation, etc., in the preparation of the patient, for we find in a few days after anaesthesia that both the hemoglobin and blood corpuscles are less than normal.

Jacquet and Offergeld could find no histological changes in the kidneys, and John C. Munroe reports five hundred cases in which casts and albumen were not increased after ether narcosis. In a series of cases which I examined the only change noticed was an increase in the specific gravity of the urine, due to the excess of urates, phosphates, etc.

Holcher claims that bronchitis and pneumonia are not due to the ether, but to secretion inspired into the lungs. I do not believe ether to be an irritant when properly diluted with air, and base my assertion upon the fact that the open method of anaesthesia has practically abolished the coughing and struggling so frequently seen with the older methods.

Post anaesthetic effects of chloroform: Chloroform combines directly with the erythrocytes causing the death of a considerable number of them and a marked dimunition in the hemoglobin.

Unger, Strossman and Bevan have found fatty degeneration of the liver and kidneys, and claim casts and albumen are often found and persist for a long time.

Battier and Soulier claim there is a dimunition in the glycogen; and since glycogen is a destroyer of poisons the amount of toxic material in the urine is increased. This they say can be prevented by lavage and the administration of glycogen and napthol. These points should be thoroughly considered as chloroform has always been the anaesthetic of choice in obstetrics.

Frankel has shown that fatty degeneration and fragmentation of the heart muscle exists; and Ajello found hyalin degeneration of the blood vessels, and products of degeneration in the spleen.

Upon the respiratory system there is primarily a reflex irritation, but secondarily the effects are similar to those of ether, only less marked. This is probably due to the diminished secretion. It produces a degeneration of the mucous membranes, especially of the stomach.

Contra-indications to general anaesthesia: The contra-indications to any general anaesthetic excepting nitrous oxide, which produces no post-anaesthetic effects, may be summed up briefly as follows: Fatty degeneration of the viscera, severe kidney or bronchial diseases, Addison's disease, marked sepsis, enlargement of the thymus and lymphatic system in general and inanitation. While not dangerous in permanent insanity, it is exceedingly so in temporary or recurrent insanity. Basedow's disease was formally considered a contra-indication to general anaesthesia. Crile (Annals of Surgery, June, 1908)) shows conclusively that the bad result formerly experienced after thyroidectomy was due to the psychic phenomena resulting from the fear of operation, and not to the anaesthetic per se. He secures the patient's consent to operate, but does not set a date. Volatile oil is administered on a cone for a few days, the patient assuming that she is receiving inhalation treatment. On the morning of the operation the pseudo-treatment is begun, but ether is soon substituted and the patient anaesthetized without her knowledge. On the evening before operation bromides are administered, and on the morning of operation morphia gr. ¼ is given.

Choice of anaesthetics: Ether is to be preferred to chloroform in cardiac disease, prolonged anaesthesia, hemorrhage, where frequent temporary removal of the anaesthetic is necessary, and in all conditions where the patient's vitality is exhausted.

Chloroform is only preferable to ether in severe bronchial diseases, high arterial tension and atheroma. I believe I can administer ether with more safety than chloroform to a patient with pulmonary diseases.

The role which chloroform plays in obstetrical work has probably been as much misunderstood as Oschsner's treatment of appendicitis. It is to be preferred to obtund the pain in delivering the foetal head, but if we consider carefully the post-anaesthetic effects upon the liver and other vicsera we readily see that toxemia is more liable to ensue after its prolonged administration than after ether. I have given ether many times for obstetrical operations, and certainly prefer it in all cases where manipulations are to be of any length.

DANGER SIGNALS, ETC.

Rapidly dilating pupils is dangerous, but a fixed dilated pupil is extremely so. A contracted immoble pupil is safe, while an oscillating pupil or nystagmus signify diminishing anaesthesia. Ashen hue is due to asphyxiation, and pallor to the gradual poisoning of the circulation, including the medullary centers. A very rapid or disappearing pulse is indicative of too much anaesthesia or shock. Cessation of respiration may be due to resistance, too profound narcosis, falling of the epiglottis or tongue, or gauze in the abdomen.

PROPHYLACTIC TREATMENT OF EMERGENCIES.

Examine the patient thoroughly and select the proper anaesthetic. In emergencies wash out the stomach; in set cases empty the bowels thoroughly and give last enema at least six hours prior to operation. A cup of tea or coffee, with or without brandy, may now be given and the patient allowed to remain undisturbed. Rest is valuable, so do not continually irritate the patient on the morning of operation. If they are fond of reading or some game encourage them to indulge in this pastime. By all means gain their confidence and speak a word of encouragement while they are going under the anaesthetic. Let them breathe through the dry cone for a few minutes, then begin the anaesthetic slowly; do not give enough at the start to produce coughing. Where a great amount of abdominal pressure is to be relieved or hemorrhage is anticipated it is well to begin saline intra-venously or subcutaneously sychronously with the operation. (Fort) The hemorrhage, however, must be controlled before the saline is begun. Prevent suffocation by allowing the secretion to drain out and keeping the epiglottis open and the tongue forward by the Heiburg-Esmarch grip. This, however, is not to be practiced during vomiting, as the vomitus may be aspirated into the lung resulting in pneumonia. Large nerve trunks should be cocanized before they are severed. If ligation of the carotids or dilation of the sphincter is practiced withdraw the anaesthetic. Always protect the abdominal contents with hot towels.

Actual treatment of emergencies: Cardiac and respiratory failures are treated by artificial respiration, oxygen inhalation, position, stimulation, cardiac massage, dilation of the sphincter and the insertion of ice into the rectum and the removal of gauze packs from the abdominal cavity. Do not incline a patient with a large abdominal tumor or ascites. Oschsner has called attention to the fact that if inspiration is produced first, the excess of anaesthetic is drawn deeper into the lungs; therefore produce expiration first. I have found rhythmical pressure with the hand or elbow over the lower end of the sternum a most excellent method of artificial respiration. Do not attempt over eighteen or twenty respirations per minute, and never given up in despair until you are forced to. Patients have ben resuscitated after one hour of labor. If the tongue is withdrawn be careful not to lacerate it on the lower incisors.

Administration. Ether: In this series of cases I have administered ether with the Allis and Clover inhalers, by the nitrous oxide ether sequence, and by ethyl chloride as a pre-

liminary to ether. On several occasions I gave scopolamine gr. 1-150, morphia sulph. gr. 1-6 to 1-8 as an adjunct, but anaesthesia was either too profound or the patient had an idiosyncracy to the scopolamine and became exceedingly restless. The results were too variable and dangerous to recommend it.

At present I have discarded all but the open drop method, because the struggling is practically eliminated, the patients are anaesthetized more rapidly (average six minutes) and I think it by far the safer way of administering the anaesthetic. One-half hour before anaesthesia is begun morphia gr. ¼ and atropia gr. 1-150 to 1-100 are given. The morphia produces a calmness and not so much of the anaesthetic is necessary to produce narcosis. The atropia not only prevents the secretion of mucus in the throat but stimulates the patient and allays fear. I am sure that a mentally and physically depressed patient does not take an anaesthetic as well as the one stimulated just to the point of good feeling.

Since I began using the open method I have had to stop the operation but once, and then in a case of ruptured ectopic gestation with active hemorrhage. The abdomen was opened, the bleeding controlled, and saline was given subcutaneously. The patient reacted and the operation was completed. I rarely ever look at the pupil or count the pulse. If the respiration is rhythmic I know my patient is all right. He is sufficiently anaesthetized if he is kept between a snore and a sigh. Just as an experienced machinist can detect a break in his machinery by a change in the sound it makes, so can an experienced anaesthetist tell the degree of narcosis by the rhythm of his patient's respiration.

Chloroform: My experience with chloroform is limited to the open method, and I must acknowledge that I am afraid of it. I do not think it should ever be used except when there is a great contra-indication to ether.

A. C. E. mixture: In the beginning of my career I was compelled to use A. C. E. mixture, but have abandoned its use. It may have been my inexperience or it may have been the anaesthetic, nevertheles it gave me great experience in resuscitation, for nearly all my patients did badly.

Ethyl chloride: I have given ethyl chloride by the open and closed methods, and consider it a safe and valuable anaesthetic in short operations. If the open method is to be used the tongue of the spray must be broken and the anaesthetic allowed to drop on an Esmarch inhaler.

Nitrous oxide: Nitrous oxide may be given with air or oxygen for operations lasting an hour or more. It is the safest of all anaesthetics, both primarily and secondarily, and I consider it the anaesthetic of choice in all operations where the patient is in extremes.

STRONGYLOIDES STERCORALIS, WITH REPORT OF THREE CASES FROM TENNESSEE.

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It has not been many years since the examination of stools by the general practitioner was almost unheard of. Even today it is unfortunately not a routine practice in all cases with bowel symptoms, but it is far more general than formerly, and those who make use of microscopical examination of the stools have fewer cases of "mistaken diagnosis" to record than do those whose far-seeing clinical eye enables them to diagnose from symptoms alone their cases of bowel disturbance.

While the purpose of this paper is to place on record three additional cases of infection with the strongyloides stercoralis, it may not be amiss to refer briefly to the method of examination of the feces. No elaborate equipment is necessary. A microscope with ordinary low and high power dry lenses, slides and coverslips and conical sedimentation glasses are all that are needed. Always examine the specimen as soon as possible after it is passed. If the fecal material is already fluid, one has merely to allow it to settle in a conical glass for a while and then draw off some of the sediment in a pipette, spread it on a slide, cover with a coverslip and examine first with the low and then with the high-power lens. If the stool be formed, a small amount of it should be mixed thoroughly with enough water to render it fluid and then allowed to stand in a conical glass until the sediment has settled, when it is examined as already described; or else, eight to ten bits should be selected from different parts of the specimen, mixed with a little water on slides, covered with coverslips and examined. Do not be content with a single examination. At least six slides should be made from the same specimen before admitting that it is negative, and in cases of continued diarrhœa examinations should be made for several days.

The strongyloides stercoralis was first described in 1876 by Normand, who discovered it in the stools of French soldiers returning from Cochin China, who were suffering with diarrhœa. Later in the same year it was more fully described by Bavey. They both believed it to be the cause of the diarrhœa so common in Cochin China, and to which the name "Cochin China Diarrhœa" had been given by the Europeans. Next it was reported from the Island of Martinique by Chauvin. The first record of its occurrence in Europe was in 1880, when Perroncito described it in conjunction with the Anchylostoma duodenale in the men working on the St. Gothard tunnel. Cases have since been found in Brazil, Russia, Sicily, Italy, Egypt, Germany, Prussia and the Dutch Indies, showing the very wide distribution of the parasite. In 1901, the first case in America was described by Strong[1], who reported one from the Johns Hopkins Hospital. Later in the same year Thayer[2] reported that case and two additional cases from Baltimore. In 1903, Ohlmacher[3] reported one case; Price[4], one case; Moore[5], one case; Brown[6], three cases, two of which were in Porto Ricans; and Hall[7], one case in a Japanese ship's cook. Stiles, in discussing a paper read by Price before the American Medical Association in 1903, speaks of four additional cases being reported from Washington and three from California. Moore, in discussing the same paper, reports two additional cases from Texas. Summing up these cases, we find that 19 have been reported from Ameri-

ca—at least three of which were probably contracted outside of the United States, leaving 16 true American cases. If there have been other cases reported, I have not been able to find reference to them in the literature at my command. I am led to report my three cases from Tennessee because of the fact that none have so far been recorded from this State and because I believe that it is important that the geographical distribution of this, as of all other intestinal parasites, should be learned as correctly and completely as possible.

The adult intestinal form of this worm is a parthenogenetic female, living chiefly in the duodenum, but also found to some extent in the jejunum. It is described by Normand as follows: "Length, 2.2 mm., average breadth, .03 mm., the body, a little tapering anteriorly, terminated rather suddenly posteriorly in a conical tail, the extremity of which appeared rounded and even a trifle dilated; * * * the surface showed a delicate transverse striation; the mouth * * * showed three small lips. It opened into an œsophagus, practically cylindrical, which occupied about one-fourth of the length of the animal, and showed neither swellings nor striations; it was followed by an intestine, with which it might readily be confounded, without a marked change in color. This extended almost to the posterior extremity of the body, but it ceased to be visible in the middle part, which was occupied by a very large, elongated ovary. The vulva was situated in the posterior third of the animal, and in its neighborhood the uterus contained five or six elongated eggs. * * * The eggs and viscera were of a yellowish green color and rather opaque and apparently finely granular."

The life cycle of this parasite is an interesting one. In the freshly-passed stool the adult worm and the ova are almost never found. Instead, we find numerous small active embryos about .3-.5 mm. long and 01.-.02 mm. broad. This is the rhabditiform stage. The change that will take place in the embryo outside of the body seems to depend upon whether it is in the temperate zone or in the tropics. In the tropics, the rhabditiform embryos soon develop into adult male and female worms, which are about 1 mm. long. The eggs laid by the females of this type hatch into another generation of rhabditiform embryos which, instead of going on to the adult sexually mature forms again, develop into a long, slender, filariform stage, the length of which is .5-.6 mm. In the temperate zone, the rhabditiform embryos, as found in the feces, are transformed directly into the filariform stage without first passing into the sexually mature worms. Apparently it is in the filariform stage that the parasite gains entrance to the body, where it is transformed into the adult parthenogenetic female. It has been shown that, if filariform embryos be fed to animals, rhabditiform embryos will appear in the stools in about seventeen days, and also the filariform embryos have never been observed to be transformed into the sexually differentiated type, so that we are led to assume that they are changed directly into the parthenogenetic female type. The life cycle in the temperate zones, then, is: The parthenogenetic mother worm deposits her eggs in the small intestine. These eggs hatch into the rhabditiform larvae, which are passed from the body in the stools and outside of the body develop in 3-5 days into the filariform embryos. These, being taken into the body, are transformed into the parthenogenetic mother worms and the cycle begins again. In the tropics, the parthenogenetic mother worm deposits her eggs in the intestine. From these hatch the rhabditiform larvae which are passed in the stools. Outside of the body, they develop into the sexually mature male and female worms, the latter of which lay their eggs and from them hatch a new generation of rhabditiform larvae. These in turn develop into the filariform embryos which, gaining entrance to the body, develop into the parthenogenetic mother worms.

The parasite is frequently found in associa-

tion with other forms of intestinal parasites. Although Price seems to think that this is more than a mere coincidence, my belief is that it is purely coincidental. The majority of the cases reported thus far are from regions where infection with animal parasites occurs in a very large percentage of all the inhabitants, and it is but natural that we should frequently find other parasites associated with this one. In two of my cases, which come from a region where intestinal parasites seem to be of rather unusual occurrence, no other parasites were present. The third case, coming from Georgia, showed an associated amœba infection.

Pathology—Although the statement is to be found in books and monographs that this parasite is non-pathogenic to man, such does not seem to be the case. In the fatal cases that have been studied, pathologic changes have been found in the intestine around the site of the parasites in the crypts of Lieberkuhn, where they are usually found. Strong, in a careful study of the first American case, which was a fatal one, found that in the crypts of Lieberkuhn containing the parthenogentic mother worms, eggs or embryos, there was a thinning and more or less atrophy of the epithelial lining of the crypt. Around it was some small round cell infiltration and in the surounding epithelial cells there were evidences of some proliferation, as shown by the presence of karyokinetic figures in the nuclei. The changes in the intestines, however, do not seem extensive enough to account for the symptoms. Reasoning from analogy with other parasites, it is highly probable that this worm may produce a toxin which, being absorbed, produces the symptoms by its toxic action on the nervous system.

Infection—Infection may take place in one of two ways—either by the mouth, in drinking water or on green vegetables, or by the skin, as shown experimentally by Stiles. In the latter case, the embryos undoubtedly pass by the same route as proven by Loos beyond the possibility of a doubt to be the case in uncinaria (hook-worm) infection. The larva, getting into the skin through an abrasion, burrows down and gets into a vein. It is then carried through the heart to the lungs. Here it is stopped by the finer capillaries and, burrowing out into the air-cells, it crawls up the bronchioles, bronchi and trachea and finally over into the oesophagus and down through the stomach into the intestines. How long the worm may live in the intestine is not known. Reinfection within the intestine, as suggested by Ward, may possibly take place and account for the long duration of the infection and its obstinacy to treatment.

Symptoms—There may be no symptoms at all and this has led to the statement that the parasite is harmless. We know well, however, that with all intestinal parasites symptoms may be slight or absent at times. Slight degrees of infection with the uncinaria may produce no symptoms. Likewise, the presence of the ascaris and the trichocephalus may never be suspected from the clinical histories of some cases, and yet the first of these is markedly pathogenic and the other two are sometimes pathogenic. As a rule, the symptoms are those of a prolonged gastro-intestinal disturbance, the intestinal symptoms being predominant. The onset is usually gradual with diarrhœa, which may be continuous or may show periods of constipation alternating with diarrhœa. There is usually no pain and no griping, except in the severe cases. The movements vary in number, sometimes reaching twenty-five or more in the twenty-four hours. One very characteristic feature is an incontinence of the bowel. Even though the patient may not be having any marked diarrhœal symptoms, he may be suddenly seized with an uncontrollable desire to evacuate the bowels. The feces may be thin or of a formed pasty nature and occasionally contain a little mucus and, less frequently, a little blood. Neither the mucus nor the blood are ever present in large quantities. Fever is absent, as a rule. Anaemia also is not present, or only to a very slight degree. The

blood examination gives us nothing characteristic.

The diagnosis of the condition is made by finding the rhabditiform embryos in the stools. In cases where there are enough parasites to cause symptoms, there are always large numbers of the parasites in the stools.

The prognosis depends upon the severity of the infection. In mild cases, the prognosis is good. In severe cases, it seems impossible to do anything to rid the bowel of the parasites.

The treatment is very unsatisfactory. Thymol, which is so valuable in the treatment of uncinaria infection, is a signal failure when used for the strongyloides. Male fern and the other anthelmintics also seem to be of no value.

Cases.

Case 1. Seen with Dr. E. G. Wood. L.A. D. Male. Age, 56. White.

Complaint. Irregular bowels and rheumatism.

History. Seven years ago contracted a chronic diarrhoea which lasted two summers. Since then bowels have been irregular, either constipation or diarrhoea. No griping, but some rectal burning and straining. Occasionally a little blood in the stools. Occasional vomiting, but appetite always good. Some shortness of breath on exertion and sometimes slight oedema of feet and ankles. Has lost 20-25 lbs. in past four years. Became a morphine habitue as a result of the free use of opium for the diarrhoea, and now uses 4-6 quarter grain doses hypodermically daily.

Examination. Emaciated. Moderate anaemia. Temperature and pulse normal. Chest negative. Abdomen—walls thin; intestinal coils visible; slight tenderness; organs not palpable. Examination of stools shows tremendous numbers of the rhabditiform embryos of the strongyloides stercoralis. Treatment with thymol failed to effect a cure.

Case 2. F.S. Male. Age, 24.

Complaint. Diarrhoea with great straining and blood and mucus in stools.

History. Always lived in Georgia up to six months ago. One year ago had an attack of dysentery with frequent evacuations containing much blood and mucus. The attack lasted about five weeks, during which time he was confined to his bed. Since then bowels have been fairly regular.

One week ago bowels began to "run off." There was much straining whenever they acted. Some blood and mucus was to be seen in the stools. There was slight abdominal pain and some fever at first.

Examination. Well nourished man. Slightly anaemic. Physical examination negative, except for slight abdominal tenderness. Examination of stools showed amoeba histolytica and also a moderate number of the rhabditiform embryos of the strongyloides stercoralis. This case probably originated in Georgia and not in Tennessee. Patient returned to Georgia, so no treatment was tried.

Case 3. Woman. Age, about 70.

Complaint. Shortness of breath, /swelling of feet and ankles and irregularity of the bowels.

History. Difficult to obtain any trustworthy statements. Seemed to have had no definite symptoms referable to the parasitic infection, except the irregularity of the bowels. Her other symptoms were referable to myocardial degeneration.

Examination. Nothing found on physical examination, except the signs of myocardial degeneration. Examination of the stools showed large numbers of the embryos of the Strongyloides stercoralis.

Treatment with thymol seemed to cause no diminution in the number of parasites.

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5. Moore: Amer. Med. 1903, Vol. VI, Page 876.

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*A DISCUSSION OF THE ACTIONS OF CERTAIN DRUGS ON BLOOD VESSELS

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In choosing the subject for discussion in this section (Materia Medica and Therapeutics),* the writer is of opinion that a brief review of the findings of modern experimental pharmacology, in regard to the most frequently used drugs acting on the vessels, will be of value. The present effort will be to summarize these findings and to point out wherein many old notions of physiological action and therapeutics, which have been handed down from generation to generation, are at variance with these findings. The advances in pharmacology are known to our students of medicine in schools of the first class, but are not within the reach of the average busy practitioner of medicine, for the reason that papers on this subject, if thoroughly scientific, are often too technical to be attractive reading to the average man, even if published in the journals which he reads. Again, certain textbooks which bear a recent date are responsible for the perpetuation of errors.

The drugs I have selected for discussion are those which are in the main, types of groups having the same or similar action. Grouped in this way it becomes easier to discuss each drug in comparison with the others.

VASO-CONSTRICTORS.

Drugs of this class act in one or more of the following ways: (1) Stimulation of vaso-motor center; (2) stimulation of vaso-motor terminals; (3) stimulation of muscle fibers in walls of vessels themselves. There is no drug which can be demonstrated to produce a vaso-constrictor effect through a paralysis of vaso-dilator apparatus. Theoretically, this is a possibility, but no technic has yet been devised to prove such an action.

In order prove a vaso-constrictor or vaso-dilator effect from a drug, there are several methods of procedure. The web of a frog's foot, the mesentery or other transparent part may be observed with a microscope before and after giving the drug. A rise or a fall in blood pressure without any demonstrable primary effect on the heart-beat gives evidence of a constriction or a dilation of vessels, respectively. This is measureable by a pressure manometer. If we wish to exclude the effect of vaso-motor center we destroy the center or sever the connection with a particular organ or region and determine whether the effect is the same as before. In *apocodein* we have a drug which in doses that an animal can bear, paralyzes the entire nervous apparatus, excepting in respect to vessels, the fibers in which they terminate. If after giving apocodein we still get a vaso-constrictor effect, we can conclude that there is a stimulating effect on the smooth fibers of the vessel walls.

Perfusion of an amputated limb or excised organ with defibrinated blood or artificial serum, and the measuring of the venous return, or of the alteration of volume, constitutes a method of excluding action on centers. A positive proof of effect on vaso-motor center is the ligation of cerebral vessels and perfusion of the brain alone with the drug to be tested. Then if a constrictor effect is obtained we have no doubt as to the cause.

DIGITALIS GROUP.

Included under this head we have a large number of drugs of widely different origins and of radically different chemical constitution. In this group are found digitalis, strophanthus, squills, apocynum, convallaria, all of

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which contain active glucosides. Adrenalin, and other supra-renal derivations, pituitary extract and cactus are also members of this group; but have been demonstrated to contain alkaloids. From a chemical standpoint still more heterogeneous members are such inorganics as barium salts; sodium bicarbonate, and sodium chloride. All the above possess to a greater or less degree the following physiological effects (Sollman):

1. Stimulation of heart muscle, and its irritability, a factor in raising blood pressure.

2. Vaso-constrictor effect, which is chiefly due to effect on muscle fibers in walls of arterioles, and partly secondary to a direct stimulation of medulla. This vaso-constrictor effect is the chief factor in raising blood pressure.

3. Vagus stimulation, secondary to rise in blood pressure due to (2). Here again can be traced a slight, primary stimulating effect on the vagus center.

As to the particular effect of the drug digitalis on the vessels, this much has been ascertained: it produces a prompt and prominent rise in blood pressure, beginning before the increase in the force of ventricular systole occurs. (Volume of perfused organs decreases after digitalis and venous return is lessened.) Vaso-constriction occurs after administering apocodein. Hence we are justified in attributing to it a direct stimulant effect on arterial muscles. Vaso-constrictor effect is most intense in splanchnic areas. This sometimes has the effect of forcing blood into superficial areas, and mechanically dilating them. Pulmonary vessels do not participate in the general constriction.

A striking bit of experimental data, illustrating the more powerful effect of vaso-constriction in spleen and leg, is obtained by obtaining curves of variations in volume respectively of leg and spleen before and after administration of strophanthin. The volume of spleen diminishes immediately, while the volume of leg increases. Strophanthin resembles in its action on vessels, digitalin, while the most active glucoside of digitalis, digitoxin, has a more powerful general vaso-constrictor effect. This may account for some of the striking clinical results obtained from intravenous injection of strophanthin, where digitoxin in form of a solution in glycerin, extensively prescribed under the trade-name, digalen, was without effect. Certain it is that the vaso-constrictor effect of digitalis is one of its least desirable features in the treatment of cardiac insufficiency, and it is our problem to get and maintain the effect on the heart muscle without unduly increasing the resistance. On the other hand, in conditions of very much lowered blood-pressure, due to a loss of tone of vaso-motor system as in shock, hemorrhage, or intoxications, this local effect of vaso-constriction is most desirable, and digitoxin would be the drug of choice, and if immediate effect is necessary, intravenous injection the only method admissible. This method admits of far greater accuracy of dosage, and if done aseptically, is free from dangerous consequences.

Probably further acquaintance with strophanthin will result in a more extensive clinical observation of its actions. Experimental works to the end of mapping out the particular field of usefulness in disease, especially valvular cardiac insufficiencies is being carried on. The almost immediate effect, the duration of a single dose, 24 hours; the accuracy with which dosage can be gauged, together with the painlessness of the intravenous injections of digitoxin and strophanthin are considerations which commend this procedure to the careful clinician. One of the first lessons learned in the laboratory work in pharmacology, especially where a class demonstration is being gotten ready, is the use of pure active principles of drugs, or at least a physiologically standarized preparation. We cannot time exactly the rate of absorption when a drug is given by the stomach and even hypodermic

medication is uncertain as to complete and full effect. Hence, to eliminate so far as is possible the variable factor, intravenous injection is resorted to as the method of preference.

SUPRA-RENAL EXTRACT AND ITS DERIVATIONS.

The work done in determining the physiological action of the extract of the supra-renal glands, culminating in the isolation of the alkaloidal active principle, called variously suprarennin epinephrin, adrenalin, etc., constitutes one of the most glorious achievements of modern experimental medicine. We now know that it is the medullary portion of the gland that yields the active principle; and although clinically the drug best known through its property of constricting vessels to which it is directly applied, it has a range of activity which can be summed up in almost the same words as digitalis, and in consequence there is no hesitation in putting it in the same group.

The most prominent effect after injecting adrenalin into a vein is an immediate rise of blood-pressure, due to a stimulation of the end organs of the sympathetic. One proof of this is failure to get specific effect after giving apocodein which, as stated, destroys the entire sympathetic apparatus, and the obtaining of the reaction after destruction of the centers alone. As could be prophesied, a result of this rise in blood-pressure is a vagus stimulation, and in consequence a slowing of the heart. Here, as with digitalis, there is also some central stimulation, and here also the rise in blood-pressure precedes the slowing of the heart. A still further analogy is observed in the stimulation of the heart muscle and an increase of its irritability. The analogy is even more complete when we consider effect on some other organs, which it is not our purpose to discuss. However, when the factor of time is considered, there is the widest difference. Adrenalin's action on heart and vessels is almost instantaneous (reaches its maximum in 20 to 30 seconds) and the effect on the circulation almost as quickly evanescent (2 to 5 minutes). Digitalis, on the contrary, is slower to act, and the effect of a single dose often lasts for days. It is not possible, in the present state of our knowledge, to account for the wearing out of the vaso-constriction effect. Fatigue has been advanced as an explanation, likewise oxidation and decomposition in blood. The first can be excluded when it is remembered that the effect can be prolonged at will by continuous injection, or by repeated injections. That it does not disappear from the blood stream, when its effect on circulation has becomes nil, is shown by injection of blood from the animal into another and the obtaining of the vaso-constrictor effect on this second one.

The most striking vaso-constrictor effect is in the splanchnic area, and in the muscles. Here the effect is so powerful as to cause a passive dilatation of the superficial areas and cerebral vessels. The pulmonary and coronary areas are probably free from a marked constriction. (Crile.)

Conspicuous as is the effect on blood-pressure through intravenous injection, the effect is nil when given by mouth and injected subcutaneously. Meltzer claims an effect on general blood pressure when drug is injected deep into the muscles. This is in dispute. During the series of animal experiments, there was observed on section rabbits, which had been the subjects of more or less extended exhibition of adrenalin, a marked atheroma of aorta. Reports of these pathological findings were disquieting to some who had become enthusiastic over the intravenous therapy. However, it was found that the atheroma occurred only in rabbits, and that fifty times the therapeutic dose was necessary to produce the characteristic change in the media.

Crile (*Jour. Exp. Med.*, VII.) and others, Miller (*J. A. M. A.*, No. XX, 1907), advocate continuous intravenous injections in 1-50,000 or 1-100,000 in shock, paralysis of heart during anesthesia, or after electric inhibition of heart.

Crile believes that where heart-beat is nil and a paralysis of vaso-motor centers has occurred, blood-pressure is reduced to zero, and it is impossible by mechanical means of saline infusions even associated with massage of heart through chest wall to secure the necessary 30 m.m. of mercury pressure in the coronary arteries, which alone will restore the heart.

By combining adrenalin with saline infusion and massage, the drug is carried to the heart muscle and distributed where most needed. He also advocates as adjuvant measures in this condition the head down position and his rubber air-inflated suit, which still further constricts the lumen of the vessels of the extremities. Crile cautions against increasing too greatly the peripheral resistance on a weak heart, thereby running the risk of producing acute dilatation. In this event the head of patient should be raised and the air cushion suit deflated to remove some of the work on the heart.

Adrenalin given into veins is not without dangers. If, for example, this were done in a case of myocardial disease, secondary to sepsis, or other acute or chronic infection, it is conceivable that in consequence of the very great rise of blood pressure, fatal dilatation might occur. It is useful in an emergency when vaso-motor paralysis occurs, and then only thrown into a vein; but it is manifestly useless in chronic conditions, and inactive given by mouth or sub-cutaneously.

ERGOT.

This is one of the most misused of drugs. The writer has seen it given by mouth and injected into the muscles in almost every kind of hemorrhage, which could not be mechanically checked. It has been warmly advocated in many inflammatory conditions, even meningitis, because of a belief that it would diminish hyperemia. It has been used extensively to increase blood pressure in conditions where it was lower than normal. The light of accurate investigation proves none of these uses justifiable. It has a certain vaso-constrictor action and causes a slight rise in blood-pressure. The vaso-constrictor effect is through ganglia or on fibers immediately central to them. It varies in different regions, and is marked in pulmonary area. There is a primary depression and a subsequent stimulation of the vaso-motor center and of the heart. Large doses produce the effect of apocodein, *i. e.*, paralyze vessels and dilate them. Adrenalin does not then produce its characteristic effect.

Bradford and Dean, in 1894, showed conclusively that it did increase pulmonary blood-pressure, and, if so, it is irrational to use it for pulmonary hemorrhage. It could only be of use if it were known to contract a ruptured vessel more at point of lesion than elsewhere. This it cannot do, and its only possible effect in this condition would be to increase the bleeding through increased pressure. In uterine hemorrhage after labor, the case is quite different, and we have a mechanical occlusion through contraction of uterine muscle fibers. Any prolonged use of ergot, as in the so-called medical treatment of myomata, or subinvolution, may result in gangrene of extremities or convulsive type of chronic ergot poisoning if drug employed is not inert.

STRYCHNIN.

Strychnin tested on animals produces a slight rise of blood-pressure, when given in doses far in excess of therapeutic safety. In ordinary doses, in man and mammals the central vaso-motor stimulation—for such the action is—is not sufficient to alter blood-pressure. Here again we have tradition at variance with experimental data. We have too often seen benefits in circulation come from therapeutic use of strychnin, and attributed them to a particular vaso-constrictor effect. This conclusion is not warrantable, and we must search further for an explanation. The explanation may be that stimulation of res-

piratory center or other parts of the central nervous system, or improvement in digestion, has indirectly brought about the effect.

VASO-DILATORS.

Under the caption, vaso-constrictors, we have purposely omitted drugs which applied locally would cause, at point of application, a circumscribed constrictor effect (astringents). So, here we shall not consider such agents as may locally produce a dilatation of vessels (irritants, etc.), and reserve the term for agents which, when thrown into the general circulation, cause a general increase in the size of the arterioles and a lessening of peripheral resistance to the blood stream between the arteries and veins.

THE NITRITES.

These constitute a class of compounds which act chiefly on the vessels, dilating them. All of the series produce their effect through a peripheral influence. Perfusion of an amputated limb with fluid containing them produces a lessening of resistance and an increase in venous outflow. The volume of limb likewise increases. Stimulation of splanchnics, after dilatation of intestinal area has occurred through their use, causes a constrictor effect. This argues for an integrity of the nervous apparatus, and speaks for an effect on the muscular tissue of the vessels themselves.

The dilatation of the superficial vessels of the face and neck is greater than is observed in other skin regions. There is reason to suspect a certain amount of central depressor effect; but this cannot be proved, as perfusion of brain alone with nitrites in solution does not cause vaso-dilator effect. Pulmonary vessels do not participate in the otherwise general dilatation. Indeed a rise in pulmonary pressure has been observed. The effect on the heart is to quicken the beat. This is secondary to a lowering of blood-pressure, but is due in part to depression of the inhibitory center of the vagus. The quickening of the heart when nitrites are given occurs before the administering of atropine, but not afterward indicating action central to the terminations of the vagus.

The member of this group which acts most quickly is amyl nitrite. This is given only by inhalation, as it is decomposed in the stomach, and its dilator effect is as prompt as the opposite effect produced by adrenalin. Its action is likewise as evanescent. Nitroglycerin can be given by mouth, hypodermically, or injected into a vein. Its effect is of longer duration. Sodium nitrite is slower still in acting, 2 to 3 minutes, and its effect last from 4 to 6 hours. The objection to its use is disturbance of stomach through partial decomposition. Erythol tetranitrate is free from this objection, and more lasting in its effect. After therapeutic doses by mouth, it acts in 50 minutes, after the effect of the others has begun to disappear, and lasts 5 hours. Reasoning from the above, if a temporary effect is desired, as in controlling for a time a vaso-motor crisis, for example, in angina pectoris, amyl nitrite by inhalation or nitroglycerin by needle, would be the preparation we should use. However, to ward off such an attack in the interval, sodium nitrite, or better still, erythol telranitrate, would be preferred. One of these might also be used in the treatment of the increased blood-pressure of nephritis or of arterio-sclerosis, where disagreeable or dangerous symptoms were known to occur, as a result of the increased blood pressure. Such therapy might protect the heart against acute dilatation, or relieve it if it had occurred, or postpone the pathological hypertrophy of the heart, which would occur in either condition. In using any of this group, throughout a long period, the blood-pressure should be our therapeutic guide, and we should bear in mind that tolerance of the drug would occur when persisted in too long, and intermit the treatment.

These drugs are not cardiac stimulants, in any sense, and from facts above stated would be contradicted in any condition where a low

blood-pressure existed, notably in shock, which is essentially a vaso-motor paralysis. Their use in cardiac disease is only indicated where there is a considerable overload of the heart, and should be considered in the same light as venesection. Very often as stated under paragraphs on digitalis, it is desirable to overcome in part the vaso-constrictor effect of this drug, and a careful balancing of the effects of nitrites and that of digitalis might be the most desirable therapy. Fortunately such an indication is compartively infrequent. With the very thoroughly studied action of lowering blood-pressure in mind, the advisability of their use in controlling internal hemorrhage might suggest itself. The indication would be absolute if the bleeding vessel could not be expected to dilate, too. This is as impossible as to expect a bleeding vessel to contract more than an intact one after ergot, or other vaso-constrictor. However, as the vessels of brain and pulmonary area do not share completely in the general dilatation, hemorrhage into these areas might be treated in this way, if the blood pressure were high, or if there were a margin of safety to work on.

I have not discussed every drug known to have an effect on the circulation. Nor have I attempted to set forth anything new in pharmacological research. This effort is chiefly to call attention to the necessity of accurate study of the effect of drugs on the vessels, to the end of having in mind a distinct and clear-cut notion of its limitations, and of what each drug can be expected to accomplish.

*ECTOPIC GESTATION.

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Extra uterine pregnancy, or extra uterine fetation, is a condition in which we have the attachment and growth of a fertilized ovum upon any part of the generative tract other than the uterine mucosa. It has been recognized for centuries, the first case being reported by an Arabian physician, Albucasis, in the eleventh century. In 1500, Jacob Nufer is supposed to have operated on his wife for this condition. Occasional cases were reported up to 1741, when Biancte made the first classification of the varieties. In 1836 Dezmiris made the classification that is used today. The first diagnosis of unruptured tubal pregnancy was made in 1883. Though the pathology of the condition was known as seen on autopsy, still little advance in management was made up to twenty-five years ago.

ETIOLOGY.

There are two views held to account for this condition: One advanced by Dr. Webster, who says that the tubal tissues must be capable of undergoing a genetic reaction, the formation of a true decidua, being then a reversion in these tissues to an earlier mammalian type, either in structure or reaction tendency; the other and the one more generally held, is that there is interference with the normal functions of the tube, due either to congenital abnormality, or to some inflammatory change within or without the tube as the result of gonorrheal infection or that following labor or miscarriage.

PATHOLOGY, VARIETIES AND TERMINATIONS.

It is generally divided into tubal, ovarian, and abdominal. Though cases of primary abdominal pregnancy have been reported, their existence is doubted by Dudley and many others, who think that such cases are always secondary. According to Edgar, ectopic gestation is variously estimated to occur from one in 500, to one in 10,000 normal pregnancies. 86.7 per cent. are tubal, 4.8 per cent. ovarian, 8.5 per cent. abdominal. The possibility of ovarian pregnancy was under dispute from the 17th century until 1901. It is very rare. In 1898 Dr. Catherine von Tussenbrœck of Amsterdam, reported a case. Bland-Sutton was unconvinced until 1901, when he made an examination of the specimen, and attested to the correctness of the claim. In the May number of *Surgery, Gynecology and Obstetrics,* there is an article reporting a case and also making a classification of all others that had been collected, sixteen of which were considered positive, all being under three month's development, fifteen probable, twelve being at term, and nine fairly probable. In 1878, Spiegleberg laid down the four necessary conditions which should be present to positively establish the existence of this variety. First, the tube on the same side must be normal and have no connection with the sac. Second, the fœtal sac must occupy the position of the ovary. Third, it must be connected to the uterus by the ovarian ligament. Fourth, ovarian tissue must be found in several sections from the cyst wall. It is often difficult, however, to fulfill all these requirements. Dr. Webster exhibited a case where the embryo was shown in the unbroken sac imbedded in the ovary. Pryor claims to have had a case at term. The great majority, however, are primarily tubal. Tait believed, and many today agree with him, that they are all originally tubal. Tubal pregnancy may be in the isthmus, ampulla, or rarely in the interstitial portion. We may have a pregnancy developing in the rudimentary horn of a bicornate uterus. Usually it is single, but may be multiple. In the *Journal of the American Medical Association,* December, 1907, five cases of twins were reported. In *American Medicine,* 1902, cases of triplets was reported.

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Both tubes may be affected or there may be a combination of the intra- and extra-uterine forms. In 1906, Dr. Barr reported a case in one side of a double uterus where no connection between this side and the vagina could be demonstrated.

The tube at first is hypertrophied, then thinned as the growth of the ovum progresses; generally grows up and posteriorly towards the peritoneal cavity, may grow down between the layers of the broad ligament, rarely reaches maturity, the death of the fœtus being due to hemorrhage, separation of placenta and starvation of ovum. The placenta is formed from tubal tissues almost entirely, unlike the formation in normal pregnancy. Webster claims that decidua vera and a decidua reflexa are formed. Bland-Sutton, Edgar and others deny this. In the interstitial variety rupture usually takes place early. If intraperitoneally it is the most serious and rapidly fatal, may take place into the uterus or the broad ligament. Abortion generally takes place by the eighth week, when the ostium abdominale is supposed to close. If complete the vessels may contract, bleeding stop and the products of conception be absorbed. If incomplete the bleeding is usually prolonged and may jeopardize the patient's life. If attempted and the hemorrhage confined, the fœtus dies and a tubal mole is formed. Rupture occurs as a rule by the twelfth week, but may occur earlier. Most surgeons claim that in very early rupture there is not so much danger from hemorrhage, but this is questioned by Douglas Taylor and others, who report cases where death followed in a very few hours. In late rupture the opening may be plugged by placenta or fœtus, the direction of rupture is most often into peritoneal cavity. If the hemorrhage is slight, an hematocele is formed, walled off, and generally absorbed, unless suppuration occurs. After rupture into the peritoneal cavity, if the placenta remains attached and the fœtus continues to grow, it constitutes the tubo-abdominal form. The placenta may be partially extruded and attach itself to any of the contained organs. Rupture may take place into an adherent ovary, or between the layers of the broad ligament. In the latter case if the fœtus dies, we get absorption or suppuration, or lithopedion. If it lives, the peritoneum is stretched and pushed up and away from the uterus and bowels to accommodate the growing fœtus. Secondary rupture may occur in this variety also, in which case the fœtus generally dies, but may continue to develop. As mentioned before, the fœtus may form a mole, may undergo fatty degeneration into a mass of adipocere or calcification into a lithopedion, or suppuration. Occasionally blood is found in the abdomen without being able to trace it to the tube. However, without other evidence, chorionic villi can usually be demonstrated. When the pregnancy reaches the seventh or eight month, or full term, spurious labor comes on, the fœtus dies, the fluids are absorbed and the size of the tumor diminishes. Such tumors have remained thirty years or more, but the woman's condition is always one of invalidism. If infection takes place, death ensues from sepsis, or the mass is discharged piecemeal by suppuration through abdominal wall, uterus, vagina, bladder or rectum. The uterus is usually enlarged and a decidua is always formed. The size of the ovaries are increased and a corpus luteum is shown.

SYMPTOMS.

In early unruptured pregnancies, there may be no symptoms prominent enough to cause the patient to consult a physician. Frequently, however, there is. In about 50 per cent. of cases there are some of the early signs of pregnancy. There may be previous history of pelvic trouble. The woman is usually in good health, mother of children, between twenty-five and thirty-five years of age, and has been sterile for some time. Nearly always there is some menstrual irregularity. Amenorrhea of long or short duration, nearly always one period has been missed, and from

one to two weeks afterwards there comes on hemorrhage from the uterus, which may be profuse, usually not, but frequently continues for some time, due to separation in whole or part of the decidua. If carefully questioned the woman may have noticed some difference in the character and behavior of this discharge, compared with the normal. In the *New York Medical Record,* June, 1906, Vineberg, in a study of 53 cases, says the three cardinal symptoms are, amenorrhea of long or short duration, irregular bleeding, and abdominal pain. There may be a sensation of weight in the pelvis, a sensitiveness and slight rigidity over the abdomen, especially at the time of the period. The pain is a very important symptom. It may be due to a small area of peritonitis, or to the uterus in its attempt to expel the decidua, but the form of greatest significance is the colicky pain due to hemorrhage between the villi and the distension of the tube. It is usually sudden and unexpected, may subside and re-appear, may be accompanied by a feeling of faintness, and the woman be compelled to go to bed. The abdomen is frequently slightly swollen. Before rupture, the pain is often burning and throbbing in character, due to increased vascularity and peritonitis. Coe says, "if the pain is sharp and colicky, localized to one side, attended by marked faintness, and followed by intervals of hours or days of complete remission, it may be pathognomonic, even without the accompanying symptoms of pregnancy and the presence of a tumor." With these attacks of pain there is generally no fever, the pulse is accelerated. When the rupture occurs, there is a sudden sharp, stabbing pain in the side, frequently so severe that the woman falls to the floor in a state of unconsciousness. Pallor is marked, lips blanched, extremities cold, skin moist and clammy, respiration shallow and sighing, temperature sub-normal, pulse thready; nausea, vomiting, hiccough and other signs of peritoneal irritation. If the hemorrhage is great and continuous, the patient may go into a state of coma, or extreme restlessness, which may end in death. If the hemorrhage is not so abundant, the patient reacts, but remains anæmic and disturbed, with sense of pain and discomfort in the region of the injury and a sensitiveness over the abdomen. If the rupture is into the broad ligament, the immediate shock is still great, but the effect of severe hemorrhage usually is not so marked, but as the hemorrhage increases the pain of stretching and pressure becomes unbearable, and Dudley adds, besides the other symptoms of shock and hemorrhage, "the pinched features, the irritable condition of the patient, the restless tossing about in bed, the bloodshot eyes, twitching of the facial muscles, clenched fingers, piercing shriek, the unbearable tenesmus, and agonized "bearing-down, leave an impression which can never be forgotten."

Physical Examination.—In all examinations and manipulations in suspected cases, one should be most gentle, remembering the great danger of bringing about the fatal accident of rupture. Before rupture there may be felt a mass to the side of the uterus, occasionally behind or before. The size varies from that of a pigeon egg to a fist or more. Generally, it is only slightly tender, pulsating in character and intermittent contractions may be felt, according to some. The uterus is slightly enlarged, and shape unchanged; the cervix is a little soft. After rupture if the hemorrhage is great, there are to be made out the signs of abdominal fluid. If not so great, a boggy mass may be felt in the cul-de-sac, soft at first, later hard, or if the hemorrhage is into the broad ligament an elastic tumor upon one side, pushing the uterus up and to the opposite side is determined. There may be a discoloration of the skin over the abdomen. If the fœtus continues to develop, the positive signs of pregnancy may be elicited with the fœtus closer to the surface than usual.

Diagnosis.—As Lawson Tait said: "Absolute, accurate, diagnosis in the abdomen is far

from possible. Only the ignorant assert that it is, and only fools wait for it." Frequently, where we cannot make a positive diagnosis, we may make a probable one with justice to ourselves and patient. In an article in the *American Journal of Obstetrics,* September, 1907, Dr. Harris has drawn a number of conclusions, made from the study of 130 cases. He says, "first, of these cases more than 90 per cent. consulted a physician because ot some pelvic trouble. Second, many of them were treated for several weeks. Third, the physicians because of carelessness and ignorance, delayed diagnosis until rupture. Fourth, most of the women were told that an abortion had occurred or was threatened. Fifth, about one-fourth were curetted. Sixth, some felt badly enough to remain in bed for days or weeks. Seventh, in the early stage only about 20 per cent. of the physicians even considered the likelihood of this trouble. Eighth, 99 per cent. in the early stage should recover. Ninth, a presumptive diagnosis is easy." He further says that when any woman after puberty and before the menopause, who has menstruated regularly and painlessly goes from four to eighteen days over the time for her period, and then begins to bleed, the discharge being different in quality, quantity or continuance from her normal flow and has pains generally severe in one side of the pelvis, or in the hypogastrium, ectopic gestation may be suspected. Note particularly any change in the discharge. It is frequently chocolate colored, may be sero-purulent and frequently has a peculiar slippery feel. Kaarsberg says, "When there is a violent or abnormally long menstruation with only a brief intermission, if any, especially when accompanied with pain in the hypogastrium, we should suspect ectopic gestation." The finding of decidual cells in the discharge is considered by some good evidence, but by others as not so valuable. With the menstrual history, the sudden attacks of colicky pains, with periods of quiet, abdominal sensitiveness and slight rigidity, with a mass to the side of the uterus, pulsating in character, and with perhaps some of the signs of pregnancy, we have a right, at least, to make a presumptive diagnosis. Diagnosis at the time of rupture is generally easy. In addition to the previous history, there is the characteristic sudden, sharp pain, symptoms of shock and signs of internal hemorrhage, with either a mass or evidence of fluid in the abdomen, and this combination forms a clinical picture, that will hardly leave any room for error.

If the fœtus is viable, there would be the positive signs of pregnancy. Where there has been a spurious labor unrecognized, a dead fœtus could with difficulty be diagnosed unless the parts could be made out.

Differential Diagnosis. — This condition must be differentiated from normal pregnancy, ovarian and uterine tumors, abortion, pyo-salpynx, intestinal perforation and various colics. Hemorrhage into an ovarian cyst, or from a corpus luteum may rarely confuse us. Most of these are easily differentiated. Probably the most difficult one is the strangulated ovarian cyst when seen for the first time. The tumor here would be smooth and tense, the uterus not enlarged and with no decidual discharge. In normal pregnancy the uterus is softer, there is only one tumor, the woman feels that things are progressing naturally. No decidua is expelled. In uterine myoma there is not usually the severe colicky pains of ectopic. In abortion we should have a reliable history that placental tissue or fœtal parts have been seen, and in this case there would be no pelvic tumor if uncomplicated. In chronic salpingitis, the woman's health has been poor, the period is usually not delayed, but frequently comes on too soon and too often. The tumor is bilateral frequently, and there is fever present. In ruptured pyosalpynx we have the history of infection, the pulse is not so fast as in ruptured ectopic, the symptoms of hemorrhage are not present, the temperature is up from the beginning, the pain is

not so severe, but continuous. In ectopic there is usually no fever, until after rupture or abortion, when absorption is taking place, and then it is usually below 100 degrees. It is generally recognized that the diagnosis of early unruptured cases is often difficult, though some men, as Hirst, for example, claim to have been so fortunate in one-half of their cases.

Prognosis.—According to present statistics, at least 50 per cent. of cases unoperated on, die, and 2 to 10 per cent. of those operated on, but as early diagnosis becomes more frequent, the prognosis will become correspondingly better.

Sittner collected 179 cases of delivery of living children. Quite a number continued to live, some were premature, some deformed, and many died later. He advises waiting until term, if possible, looking upon the results in such procedure much more favorably than others.

Treatment.—Up to recent years the treatment was one of inaction with hope that a favorable termination might result. It is strange how long it took surgeons even of great ability to attack this condition in life, the pathology of which they were familiar with from post mortem examinations. Tait, himself, says that he was actually shamed into doing his first operation from the unfortunate outcome of a case at Wolverhampton, in which the diagnosis of extra-uterine pregnancy was made by the medical man who requested that he operate. Though Tait agreed with the diagnosis, he had not the courage of his convictions and gradually allowed the woman to bleed to death. From that time until now the number of cases operated on has been gradually increasing each year, with a careful analysis of symptoms and early diagnosis, and timely recognition of the dangerous accident, and the results have correspondingly improved with the advance of abdominal surgery. Parry[1] compared the condition with rupture to a wound severing an artery, and Werth the condition to a malignant tumor. However we may look at it, the only rational treatment is operation, and that as early as possible, except in rare cases where the child has passed the seventh month, the family is anxious for it to live and are willing to accept the risk and responsibility. In early cases wherever there is a fair presumption, the abdomen should be opened and the mass removed entire. After rupture or abortion, if the woman is not in too much shock, operate at once. Give as little anesthetic as possible, clamp the vessels, give hypodermocylsis or intra-venous infusion, if indicated, lift out the clots, remove the tubal mass, pour in saline solution, and close without drainage. In the interstitial variety with rupture, it may be necessary to do a hysterectomy. If the woman's condition is good, we may do a vaginal section and drain, but if hemorrhage continues, abdominal section will have to be performed. As a result of a study of a number of cases, Orthman favors the vaginal route in early ruptured cases, because of a difference of three per cent. in the mortality. Noble in a report of 91 cases, operated abdominally in 89, two of which had first been opened by the vagina. Of these cases seven were unruptured, and in seventy there was complete or incomplete abortion. In late cases, if possible, remove the entire fœtal sac, but if there is danger of hemorrhage from the separation of the placenta, remove the fœtus, let the cord bleed, tie the ovarian artery, and leave the placenta in either to be absorbed or preferably pack around it and allow it to drain away. If possible, open extra-peritoneally. If it is not, suture the sac to the abdominal wall before opening. If there is infection and suppuration, if possible, drain through the vagina. In cases of early rupture in which there is a good deal of hemorrhage and severe shock, it is at times difficult to say which is the proper course: to wait for some reaction, which takes place in most cases; or to operate at once, preferring the risk of the additional shock due to operation to the danger

of continued hemorrhage. In such cases the patient should be put in the most favorable condition for observation, the pulse noted every few minutes, watch closely every change in color or mental state of the patient which might guide us in determining whether shock was deepening or her condition slightly improving with reaction from the accident.

Before detailing the cases, I wish to express my indebtedness and my thanks to Dr. A. T. Rossano, my former associate on the House Staff of Harlem Hospital, New York City, in which hospital the cases occurred, for his kindness in collecting the histories for me.

I. The first case it was my privilege to witness was one of such extreme gravity, so unfortunate in its termination, so typical in its clinical picture, and made such deep impression on me that it awakened a most lively interest in the subject which has continued to grow with the opportunity of observing each succeeding case. A call was sent in for an ambulance. I answered it, getting to the house probably thirty minutes afterward. When I entered the room the woman was moribund, lying upon the bed, the only sign of life being an occasional involuntary effort at inspiration. Following a few inquiries and a sufficient physical examination it was evident that the woman had suffered from a severe internal hemorrhage. Fifteen minutes before the woman had been talking naturally to those around her. The hemorrhage had come on so rapidly and the effect had been so overpowering that the family had not noticed the great change and the patient had not been able to call attention to her serious state. This was most probably a rupture of an interstitial tubal pregnancy.

II. The second case was one of special interest to me from a certain peculiar occurrence in connection with it. A hurry call was sent in, and I was asked to take it. Whether from effects of recent discussion of and resulting interest in the subject, or from whatever cause, as soon as seated on the back of the ambulance there began to pass before me the character of case that was to present itself and the incidents which were to follow. On arriving I found things just as I had seen them, and proceeded to act accordingly. The case was one of a young Italian woman, first pregnancy. Had missed the last two periods. Three hours before seen she was seized with violent and sharp pains in the right lower portion of the abdomen and vomited. Symptoms of shock soon developed. She was in extreme condition when seen, pulse barely perceptible, conscious, very weak. Abdomen distended, and tender all over. As soon as put in the ambulance, I made compression of the abdominal aorta as high up as possible, and this compression was continued until the abdomen was cleansed for operation. At the time I thought I was doing a great deal, but since then I have doubted more and more whether I had practically done anything toward improving her condition. No mass was felt, but the whole wall was tender. Was operated on immediately. The abdominal cavity was filled with blood and clots, right tube enlarged and ruptured, and there was a twin pregnancy found of about three months' development, each fœtus having its own placenta and membrane. The cavity was irrigated, bleeding stopped, tube removed, and abdomen closed. An intra-venous infusion of 1500 c.c. saline solution was given on the table. The patient did fairly well for several hours, when rapid dissolution occurred.

III. The third case, admitted January 28, 1908, twenty-eight years of age; married. No previous history obtainable. Said to have arrived in New York, November 2, 1907, and from November 3 until the latter part of December, she had had a bloody vaginal discharge. Then the flow stopped and she began to experience abdominal pains, which had grown steadily worse, confining her to bed. On admission, temperature 99, pulse 100. Abdomen prominent and voluntarily rigid. Round

mass in median line the size of a large orange, vaginally the cervix was hard, long and pointed to the symphysis. The fundus could not be mapped out. Large tender and tense mass to the side of the uterus, seemingly crowding the uterus and all down toward the outlet. Provisional diagnosis, ovarian cyst, with twist in pedicle. The next morning while being examined by the visiting surgeon, the tumor broke and the patient went into shock and collapsed with all the signs of internal hemorrhage, rapid, feeble pulse, thirst, anxiety, pain, and generalized tenderness. Taken to the operating room and opened at once. Large quantity of bloody fluid and old clots escaped. Some of the bleeding was active and fresh. Right tube was found large and ruptured and adherent to the lateral wall of the pelvis. Tube was clamped and removed. Bleeding from old adhesions could not be stopped, so vaginal section was done and the bleeding area packed with iodoform gauze. She had some fever for several days, but aside from that made a good recovery.

IV. Admitted February 10, 1908, aged 27; single. Denied possibility of pregnancy, the last period was three weeks ago, which lasted two weeks. Seven days before admission, her discharge stopped and she suffered with sudden cramp-like pains in the right iliac region, and later in the hypogastric region, pain worse at times. Had not vomited, but was nauseated on day of admission; had been in bed four days. Temperature 100.4, pulse 120. In the right lower quadrant of the abdomen there was tenderness, and a mass just above the brim of the pelvis. The uterus is fixed and larger; vaginally the mass was felt extending upward and to the right of the uterus, being tender and hard. On opening the abdominal cavity it was found that the omentum and small intestines were adherent to the abdominal wall and pelvis, thus walling off a cavity that was full of old clots and fluid. Tube found to be enlarged and ruptured, the ovaries cystic. These were removed, the cavity cleansed, and abdomen closed. Recovery good.

V. Admitted September 25, 1907, aged 26; married. One child, two years old. Supposed to have had an abortion two months ago, was well for two weeks, then had more bloody flow for two days, passing several clots. For six weeks previous to admission she would flow for two or three days in every two weeks, the last bloody discharge being day before admission. A week ago she had cramp-like pains in the lower abdomen, more on the left side, associated with tenderness. Two days ago she had chill, fever and sweat. On day of admission she also had chills and vomited several times. In extremely weak condition. Temperature 100.4, pulse 96, respiration 30, and appeared septic, so much so that one of the surgeons walking through the ward noticed her and predicted a fatal issue. Her condition was so poor that the operation was started with cocaine. When the peritoneum was reached, ether was administered, patient taking only about half an ounce during the entire operation. The abdomen was full of dark fluid blood and some clots. Left tube was enlarged and ruptured. Removed, cavity cleansed, and abdomen closed. 1000 c.c. sterile saline intravenous infusion. Patient made a slow, but good recovery.

VI. Admitted October 21, 1907, aged 35; married three years. Menses irregular for first six years, but regular for the last fifteen years. No children, one miscarriage a year ago. Last regular period five weeks ago, but at this period as well as the one before it the amount of blood was slightly less than usual. Yesterday felt perfectly well, today while boarding street car noticed sudden sharp pain in lower abdomen; while in car pain increased to such an extent she got off in order to get to a friend's house. She was able to walk one block, but in attempting to go up a flight of stairs she fainted. When seen was suffering

from air-hunger, was pale and in great shock. Pain was severe and radiated to vagina. She vomited, was so weak she could not raise her head from the pillow. Physical examination: young woman, well nourished, conscious, but pale; skin moist and clammy, thirsty and in shock. The abdomen firm, round, tender in the lower half, vaginally a tender mass was felt upon the left side. Pulse 84, temerature 98. Operated on the same night. Abdominal cavity found to contain a large amount of blood and clots; left tube enlarged and ruptured. Removed, abdomen closed and intravenous infusion given. Recovery good. Diagnosis by physician who sent in call was "Vaginitis with syncope."

VII. Admitted October 10, 1907, aged 25; married. Last period August 28; one child. For nine days before admission patient had slight bloody vaginal discharge. Three days before admission had some abdominal pain. On the evening before, while at stool was seized with severe abdominal cramps to right and below the umbilicus. Fainted several times and also vomited during the evening. On admission she still had pain and was thirsty and suffering with air-hunger. Temperature 98, pulse could not be counted. Woman was poorly nourished, expression anxious and suffering from shock. Abdomen distended, uniformly rigid and tender on the right lower side. Taken to the operating room at once. Abdomen found full of bloody fluid and clots. Right tube enlarged and ruptured, bleeding actively. Mass removed, cavity cleansed, abdomen closed, 1000 c.c. saline infusion given; returned to ward in fair condition. Recovery prompt.

VIII. Admitted August 27, 1907, aged 24; married. History of pelvic peritonitis two years ago. Menses always irregular. Had a five-months' miscarriage and a seven-months' premature child. Last menstruation June 13. Three weeks before admission patient noticed a slight bloody discharge occurring irregularly; at the same time had some abdominal pain. On the evening of the second day before coming to the hospital, patient was seized with cramp-like pains in the lower abdomen and vomited. The pain had continued since and at times was sharp, like a stab. Pain referred more to the left side. On the evening before admission she experienced a sudden sinking sensation, accompanied by great thirst, and also vomited several times. She had no fever or chills; she was constipated and had pains in the region of the rectum. Physical examination: rather delicate in appearance; abdomen rigid and tender in the lower half. Vaginally the uterus found slightly enlarged; cervix, soft; mass in each fornix; larger, more tender and more elastic on the left side. Bloody discharge present. Temperature 99, pulse 96. Next morning after being examined by the visiting surgeon, patient suddenly went into shock, pulse reached 140, skin cold and clammy, expression anxious, together with thirst and other symptoms of hemorrhage. Operated on at once; abdomen contained blood and clots; left tube enlarged and ruptured from which a two-months' fœtus had escaped. This was removed with tube. Upon the right side there was an old hematosalpinx, which had probably originally been an ectopic pregnancy. This was also removed, together with a portion of a cystic ovary. Intravenous infusion of 1500 c.c. given; patient sent to ward in fair condition. Recovery slow, but good. Several days after operation, she passed a complete decidual cast of the uterus.

IX. Admitted August 7, 1906. Aged 40; married. Last period was missed. Nine days before admission patient was taken with severe pain in the lower abdomen and back and was nauseated. A continuous slight vaginal discharge was present; was a well-nourished woman; had tenderness in the hypogastrium, with tenderness and rigidity over the right lower rectus. Swelling and boggy mass in posterior cul-de-sac, with tenderness and fluctuation. Temperature, pulse and respiration,

normal. Posterior vaginal section performed; dark, bloody fluid and clots removed; pelvic cavity packed with iodoform gauze. Recovery uneventful.

X. Admitted July 7, 1907, aged 24; married. Menstruation always painful. One full term child five years ago. Five weeks ago patient had menstrual flow, which has continued since; had chills almost daily, with temperature 100 to 102. Two weeks before admission had severe pains in lower abdomen, with vomiting, chills and fever. Pain more severe on the right side. Temperature 99.8, pulse 100. Physical examination: Pale, waxy-looking female; abdomen tender and rigid in the lower half, especially on the right side, where there was an indefinite mass; vaginally a large tender mass was felt in the posterior cul-de-sac. Pus tube with abscess formation, was diagnosed. Vaginal section done with only the finding of blood. Abdomen then opened; bloody fluid and clots in the cavity; right tube enlarged; ruptured and collapsed. Removed, abdomen closed and vaginal drainage left in. Recovery slow.

XI. Admitted June 28, 1907. Aged 42; married. Two children, the youngest 12 years of age; last period May 8. Day before admission patient experienced sharp pain in the abdomen, and had bloody discharge from the vagina; was a well-nourished woman; temperature 100.8; pulse 140, feeble in character. Was in a good deal of shock; expression anxious, rigidity and tenderness in abdomen; tenderness in the cul-de-sac. Operated on immediately; cavity found full of blood and clots. Tube enlarged, ruptured and still bleeding. This was removed and treatment as usual. Recovery normal.

XII. Admitted April 9, 1907, aged 23; married; no children; two miscarriages at two and six months, respectively. Last period January 28. Four days previous to admission had been complaining of pain in lower abdomen and back, especially upon moving of bowels. At times the pain was worse than others. For the last three days there had been a bloody vaginal discharge. Pain and tenderness over the lower half of abdomen; tender mass in cul-de-sac. Operated on April 12, three days after admission. Mass found to be right-sided tubal pregnancy. Treatment usual; recovery good.

XIII. Admitted first part of May, 1907. Diagnosis of extra-uterine pregnancy made. Patient's condition was good; operation was delayed for a few days. Examination under anæsthesia revealed no mass, so only a curettage was performed. Admitted for the second time May 24, 1907. For the two days before admission had pains in the lower abdomen, violent in onset and were intermittent in character. Temperature 104; pulse 104. Abdomen rigid and distended. Large mass to the left extending almost to umbilicus. Large tender mass felt in cul-de-sac. Operated on left tube; found enlarged and ruptured, containing fœtus and placenta. These were removed. Patient seemed to be in good condition. There was no active hemorrhage, and she appeared to make a good recovery. In the Fall she returned to the hospital with acute intestinal obstruction, and died after operation.

During the short period of a month this spring in Nashville, I have seen one operation, and learned of another case where diagnosis was made before rupture. The first was that of a woman aged 28, sterile for two years; never very strong since the last labor; missed her period in March and again in April. The latter part of April she began to suffer with slight colicky pains in the lower part of the abdomen, mass felt to the side of the uterus, but contrary to the ordinary run of cases, there developed no irregular bleeding until two days before operation in the first part of May. The time was set for operation; three-quarters of an hour before this time she began to suffer symptoms of shock and internal hemorrhage so severe that by the time she was

put on the table she was practically exsanguinated, and could scarcely breathe because of the great abdominal distension from blood. Abdomen opened, bleeding vessels clamped, products of gestation were found in process of expulsion from the end of the tube.

The other was a case, the history of which I do not know, but I saw the operation. Ectopic had been suspected and was verified. There was no hemorrhage in the abdominal cavity, but the large tube was removed, and found to contain the fœtal sac.

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EDITORIAL

THE EXISTENCE OF TROPICAL DISEASES IN THE SOUTH.

Since the Spanish-American War and the constant communication between this country and the South American countries, especially Cuba and the Panama Canal District, there is a strong likelihood that the physicians of the South will have to contend with certain tropical diseases, which will be brought into this country by the interchange of travel. There can be no doubt but that amœbic dysentery is far more common than ordinarily conceded. The writer has seen in the last six months seven cases of diarrhea in which the amœbæ was found in the stools. None of the cases had been in foreign countries, and evidently had been infected from other cases imported. It is good practice in every case of obstinate diarrhea that the doctor examine the stools carefully and thoroughly for the existence of the amœbæ, and it should be remembered that if the dejecta is allowed to cool, the motility of the micro-organism ceases, making it extremely difficult to find, hence the stools should be gotten preferably by a long rectal tube and immediately submitted to microscopical examination. If this is done as routine practice throughout the Southern States, I feel sure that many cases of amœbic dysentery which have heretofore been overlooked will be reported. The same is possibly true, especially in the more southern portions of this country, with uncinaria. Since Stile's work in this regard cases have been reported from widely separated communities of Hook Worm Disease, and it is with the hope that the doctors in the South will make examinations for this and other tropical diseases that this article has been written.

The proven cause of so many of these specific infectious diseases is so well known now and such wonderful lessening in their dangers as shown by yellow fever in Cuba and pernicious malaria in the Panama Isthmus that the profession not only deserves the thanks of this country, but should be inspired to great labors in this connection until all epidemic diseases will be practically kept from our borders.

This Journal is open to reports of cases from any reliable source throughout the South and will welcome any original work along this line. We are now trying to arrange for a series of articles on the methods used and the diseases met with and controlled, from the pen of one who has spent years under Dr. Gorgus of the Panama Canal Commission, and it is hoped that from time to time we may be able through photographic slides to give our readers the benefit of the various rarer forms of parasites seen in that country by mounted specimens. We feel that in doing this we can give our readers the benefit of accurate pictures of these micro-organisms as well as the result of practical experience gained by work in that district from the hands of a man who is thoroughly competent.

THE WATER SUPPLY OF CITIES.

Since the discovery of so many water-borne diseases, and especially the almost universal prevalence of typhoid fever from this source the question of the water supply of cities and towns is not only becoming one of great scientific interest, but of actual economic importance. The health of any community and the mortality rate of any city are important factors in determining their population and pros-

perity. If the people could be educated in the well-known facts that such diseases are preventable, it would not be long before laboratories with competent men at their heads would be established in every town of any size throughout the country. Until this is done it matters not how careful the doctor may be in the prophylaxis of any individual case, it will not be possible for us to stop the ravages, especially of typhoid fever. It is the duty of the physicians in any community to join forces with Boards of Health in the demand for such facilities as will enable them to combat and prevent these infectious diseases. Notwithstanding the fact that medical men dislike mixing with politics, the day has arrived when their duty as citizens is such that they cannot longer permit the people to blindly refuse the protection which is theirs by right of recent discoveries in preventive medicines, and this can be had at little expense, comparatively speaking, and should be the topic for discussion in every medical society throughout the South, until all opposition is overcome, and the people protected from these unnecessary scourges of mankind. Leading to a practical application of the above suggestions I would advise that the Presidents of the various local societies appoint a committee on publicity, whose duty shall be to inform the people by whatever means they find necessary, so that an awakening to the dangers of tuberculosis, typhoid fever, etc., will be produced to the extent that they will demand of those in authority protection, and as a call of the people is the only demand to which politicians would respond, we must of necessity educate them before we can hope for their co-operation. When this is done, the constant reflection on the profession of repeated epidemics of these diseases will have been stopped, and they will indeed take their normal place as the protectors of their fellowman throughout the country.

ATLANTA MEETING, S. M. A.

Reduced railroad rates for the Atlanta meeting of the Southern Medical Association have been granted by the Southeastern Passenger Association. Dates of sale are Nov. 7, 8 and 9, good for returning on or before November 14. These rates apply to the six States composing the S. M. A., also to Kentucky, and probably to the Carolinas. Round trip tickets should be bought, but these can be had only at coupon stations. Let any one intending to go arrange to buy his ticket at the nearest coupon station. The meeting promises to be largely attended, and full of scientific interest. If the reader is not already a member, he should send his application to Dr. Oscar Dowling, Secretary, Shreveport, La. The membership fee to be enclosed with the application is two dollars. (G. C. S.)

ABSTRACTS OF CURRENT LITERATURE

MEDICINE

THE SYMPTOMS AND CONDITION OF THE BLOOD IN PERNICIOUS ANEMIA.

The *Practitioner,* London, Vol. 81, No. 2, August, 1908.

J. George Taylor thinks pernicious anemia more frequently diagnosed since blood examinations are so frequently made, also gives an analysis of ten cases as to their symptoms and blood findings. All ten cases complained of loss of strength, palpitation and dyspnoea and five suffered from pain in the abdomen; the patients were well nourished, one was jaundiced and one had marked lemon color of the skin. The skin is usually dry and slight petechial hemorrhages may occur underneath it. Oedema was present in every case, the most frequent places being the lower parts of the legs and eye lids. Hemorrhage in some part of the digestive tract occurred in more than one-half of the cases.

In all his cases there was a pulmonary haemic bruit and in six there was a systolic murmur heard at the apex. The digestive tract was involved in some way in every case; all had loss of appetite and five had epigastric pain; vomiting occurred in seven cases and in two was most intractable; diarrhoea occurred in all except one. In certain cases nervous symptoms were prominent.

The blood examination showed the hemoglobin to have an average of 42.4 per cent. Of greater importance is the relation of the percentage of hemoglobin to the percentage of red blood cells. Generally the fewer the red blood cells the higher the color index; the reds are reduced in number. Polychromatophil and granular degeneration of the red cells occur, the former being very constant, normoblasts generally occur, but of greater importance is the presence of megaloblasts; the discovery of a megaloblast with large nucleus is almost pathognomonic; sometimes find Engel's metrocyte, this is a megaloblast in which the nucleus occupies four-fifths of the cell and is reticular, and the surrounding protoplasm shows polychromatophil degeneration. The white blood cells are reduced in number, average being 3200 per cmm.; this with lymphocytosis being most characteristic of the whites. The per cent of polymorphonuclears falls as the per cent of lymphocytes rise. The eosinophiles most always below 4 per cent. In some cases may find few myelocytes.

(O. N. B.)

OPHTHALMO REACTION OF TYPHOID FEVER.

(By Chantemesse, in *Bulletin de l'Academie Med.,* July, 1907.)

The author has demonstrated an ophthalmic reaction in persons suffering from typhoid fever, which is analagous to that obtained in tuberculosis.

He adds absolute alcohol to a pure culture of typhoid, which produces a precipitate, and this precipitate is dissolved in distilled water. It requires 1-50 milligram of the solution to provoke the reaction. From two to three hours after it is instilled into the eye, there appears some redness, swelling, lacrymation, and often times a serofibrinous discharge. These symptoms subside in four or five hours. He is of the opinion that the reaction will assist in the

diagnosis of typhoid at an earlier period than the Widal test. He inoculated rabbits with typhoid cultures and obtained a positive typho-ophthalmic reaction within 48 hours.

(Wm. L.)

THE TUBERCULIN SALVE.

(By E. Moro, *Munich Med. Woch.*, Feb., 1908.)

Moro describes a new method in the diagnosis of tuberculosis which, if the favorable account as given by him should be confirmed, the method should take front rank in point of simplicity and harmlessness. The salve is composed of equal parts of Koch's original tuberculin and of anhydrous lanolin. About 1-10 gram of this ointment is rubbed into the skin of the epigastrium or of the pectoral region for one minute over a surface two inches in diameter. There are three positive reactions which he describes as follows:

1. A mild reaction only shows a few pale red nodules which appear between 24 and 48 hours after the application. This may last several days.

2. A moderate reaction consists in the appearance of a number of bright red nodules, within 24 hours after application, attended with some itching.

3. The severe reaction is still more rapid. The number and the size of the papules are increased and the eruption has a tendency to extend beyond the seat of the inunction. The papules simply dry and desqumate. No conditional reaction ever manifests itself.

(Wm. L.)

OBSTETRICS AND ABDOMINAL SURGERY

TREATMENT OF ACUTE MAMMARY ABSCESS.

(Alexander Lyle, M. D., *New York Polyclinic Journal,* August, 1908.)

The fact that acute mammary abscess can be effectually cured in a period of ten to fourteen days, and the function of the breast restored after that time—in the vast majority of cases—if the proper form of treatment be carried out, appears to have been overlooked by many members of the profession at the present day. A fissured nipple can usually be discovered as the avenue of infection. Antiseptic dressings, with the constant application of the ice-bag, will, in some cases, prevent suppuration; but should suppuration occur, the breast should be incised at once.

The incision should be made parallel with the lacteal ducts, *i. e.*, radiating from the nipple, after the skin has been injected with a one-half per cent. cocaine solution. The pus is evacuated, the cavity thoroughly irrigated with a warm saline solution, and the finger introduced to break up all pockets. The sharp curette is now made use of, and the walls thoroughly curetted. The cavity is again irrigated, after which the finger, wrapped with sterile gauze, is inserted and the walls of the cavity carefully wiped to remove any small particles left by curette. Irrigate again and pack the cavity with sterile gauze for a few moments, in order to dry it. Remove the gauze and apply pure carbolic acid. In small cavities, cotton wound on an applicator and saturated with carbolic acid may be used to wash down the walls, but in larger cavities it is preferable to pour in a quantity of it, so as to allow it to come in contact with all portions of the cavity. This is neutralized, after a couple of minutes, with pure alcohol. The cavity is now carefully dried, and a small wick of gauze put into the skin incision, not into the abscess cav-

ity. If the skin incision has been long, the edges of the upper portion may be brought together with sutures, leaving only a sufficient opening for the necessary drainage. This is now, as nearly as possible, a sterile wound. The plastic lymph has been curetted away, and if the walls can be brought together, an adhesive inflammation will ensue that will promptly obliterate the cavity and effect a cure. Here we must rely on compression, and it must be of such a character as will mould itself to the irregularities of the injured breast.

A large sea-sponge best answers the requirements. This should be flat, two or three inches thick (when wet) and slightly larger in diameter than the affected breast. The preliminary preparation of the sponge consists in frequent washings to remove sand and shells, and finally in a prolonged washing in a hot two and one-half per cent. solution of carbolic acid. It is then squeezed as dry as possible, placed hot upon the breast, covered with oiled silk, and held in place by a firm roller bandage, extending not only about the chest, but also over the opposite shoulder, so as to form a firm support to the breast. A small portion of the sponge is left exposed at the clavical, and the patient instructed to pour in two or three ounces of a hot two and one-half per cent. solution of carbolic acid every four hours. This keeps the sponge moist, and consequently it expands to its limits and a constant equal pressure is exerted. Be careful to see that the breast is empty and that no milk remains in the ducts before compression is applied. The sponge is changed daily, thoroughly washed in hot carbolic solution and reapplied. The gauze wick is removed at the end of twenty-four hours and not reapplied. In a few instances the above solution may cause some irritation to the skin, in which case its strength can be reduced. The discharge from the breast will be bloody pus for about two days; it will then change to a seropurulent, and finally to a very light serous, so that at the end of eight to ten days there is no discharge. When the discharge ceases, we know that the cavity is obliterated and the compression can be dispensed with. All that remains is the skin wound, which can be rapidly healed by the application of icthyol ointment.

When the sponge is removed, the milk will return unless there has been very extensive destruction of the gland. (G. C. T.)

THE TREATMENT OF APPENDIX ABSCESS.

(By Archibald W. Cuff, B. A., M. B., B. C. Cantab., F. R. C. S. Eng. Surgeon to the Royal Infirmary, Sheffield, *London Lancet,* Aug. 8, 1908.)

The presence of pus as a complication of appendicitis is a very serious menace to the life of a patient. It is impossible to foretell whether diffuse peritonitis or localized abscess will ensue. Even if the latter should result the risk to the life of the patient is still great, as the abscess may at any time burst into the general peritoneal cavity. Other complications that may arise are toxemia, septic venous thrombosis and pyæmia. The patient's life is jeopardized by waiting and convalescence is prolonged. Early operation with evacuation of pus and primary appendectomy is advised as soon as possible after diagnosis.

While theoretically in dealing with free pus in the peritoneal cavity there is danger of spreading it to unsoiled intestine, and increase peritonitis and toxic absorption, practically, this area can be avoided by moderate care and caution. It is easier to remove the appendix then than to wait for secondary operation after formation of adhesions in which there may be great difficulty in identifying the appendix; furthermore, the patient should be spared the risk of a second operation and anæsthetic if possible. While in many instances there is never again any trouble after merely draining the abscess, Treves has estimated that 17 per

cent. have recurrence in some form, and 40 per cent. of that number have been the subject of sinus.

The primary removal of the appendix adds very little to the gravity of the drainage operation. The wound will close more promptly and the patient is not the subject of an unpleasant sinus or fistula, which may persist for months if the appendix is not removed, leading necessarily to the formation of a weak scar and liability to subsequent hernia.

While some surgeons advise opening these abscesses through the vagina or rectum, this method is unsatisfactory and dangerous in some cases. Unsatisfactory because other abscesses may be present, distinct, and remotely situated from the pelvic abscess drained. Dangerous on account of pus gravitating up to diaphragm and subphrenic abscess result when pelvis is elevated in performing this operation.

Based on the above facts the operative treatment of appendiceal abscess should conform as near as possible to the following proposition:

1. Choose the abdominal route.
2. The incision should be placed to allow easiest access to the origin of the trouble.
3. Incision should be large and capable of extension so as to insure easy manipulation and quick operation.
4. Do primary appendectomy and avoid second operation, if possible.
5. Do as little mutilation as is compatible with thoroughness.
6. Avoid two incisions if one properly placed will answer the purpose.
7. Drainage tube, both in size and number, should be reduced to a minimum, because tubes are liable to injure peritoneum and predispose to intestinal obstruction from adhesions as well as leave a weak scar.
8. Avoid injury to nerve supply and muscular fibers.

Seventy-six pus cases are reported occurring in the last 3 1-2 years, 8 of that number having diffuse peritonitis, the remaining 68 having abscess of every size and position not necessarily walled off, but more or less limited to appendix region in which the greater part of the boundaries are formed by abdominal parieties and small part by intestines. Of the 8 cases of diffuse peritonitis there was a mortality of 50 per cent—one of that number recovered from peritonitis, but died three weeks later from intractable fecal fistula and sloughing wound. (The appendix was not removed at time of operation.) Of the 68 cases of abscess which were operated upon there were but two deaths, a little less than 3 per cent. mortality, as compared to 11 per cent. mortality given by Battle as the conjoint result of the operations at Guy's, St. George and Middlesex Hospitals. Battle records a mortality of 10 per cent. in a series of 100 cases under his own care.

It is impossible to lay down definite rules when to operate in appendicitis. Undoubtedly the presence of pus calls for immediate operation, particularly if symptoms do not subside in thirty-six hours pus is probably forming; if forty-eight hours pass without improvement pus is nearly always present.

Incision made at outer border right rectus. Pack off carefully in every direction and liberate pus; roll to right side, protect edges of wound with gauze; mop out thoroughly the fluid and free the appendix in the ordinary way; be especially careful to bury stump, either in cæcum or in its own peritoneum. Use drainage as necessities of the case demand. Washing out an abscess cavity should never be done.

After Treatment.—Place on right side, elevate head of bed 9 to 12 inches. Keep elevated until discharge from wound ceases, distension is gone and bowels act satisfactorily. Saline injections per rectum, pint every 4 hours until patient is out of the woods. The Murphy and Monyihan continuous rectal infusion is not advocated, as it seems more difficult and less satisfactory than the three or

four hourly infusions. Nursing with it is more difficult and discomfort of patient greater. In ordinary cases bowels opened on third or fourth day. Remove tube third day, dress daily and gradually shorten tube until the wound has healed. (W. D. H.)

THE NECESSITY FOR THE REMOVAL OF THE APPENDIX AFTER PERITYPHILITIC ABSCESS.

By William Henry Battle, Surgeon to St. Thomas Hospital. (London *Lancet,* July 11, 1908.)

The treatment of perityphilitic abscess is most safely carried out in two stages.

First Stage—Evacuation of pus and drainage.

Second Stage—Removal of appendix.

No patient is safe after abscess formation until the appendix has been removed. Trouble will invariably come sooner or later. The appendix is not obliterated by suppurative process, but remains subject to gross disease which in 20 out of 70 cases gives rise to a return of symptoms.

Objections to subsequent removal have been raised:

1. Operation difficult and dangerous.

2. That few cases require removal as appendix is claimed to be obliterated by suppurative process.

The surgeon should surmount all difficulties in the interest of his patient. The operation is not dangerous if properly performed. The second objection is incorrect as will be shown in the pathological condition described below:

A. When the symptoms of appendicitis recurred or another abscess formed. Showing signs of recent inflammation, 1; chronic inflammation with scars of old perforation, 1; concretion and old perforation, 1; kinked, 1; kinked and adherent, 1; kinked, strictured, with scars of old perforation, 3; strictured, 2; strictured with retained concretions, 1; very adherent, strictured, old perforation, 1; universally thickened, stricture, scars of two perforations, concretions, 1.

B. Sinus formation after treatment of abscess. Chronic inflammation with close adhesions, 1; with old perforation, 1; recent perforation, 1; stricture, 1; stricture, concretion, old perforation, 1; very adherent, stricture, old perforation, 1.

C. Removal during a later peritonitis, the earlier abscess treated elsewhere. Recent perforation, 2; in one with a concretion.

D. Removal when no symptoms have arisen since the closure of the abscess. Marked chronic inflammation, 5; chronic inflammation with old perforation, 4; old perforation, 5; kinked, stricture, concretion, 1; kinked, stricture, perforation, 2; stricture, old perforation, 8; stricture, 9; doubled on itself, 1; contained thread worm, 1.

E. Removal after definite rupture into bowel. Marked chronic inflammation, 2; with old perforation at tip, 1; stricture, 1; kinked, stricture, recent perforation, 1; concretion, recent perforation, 1.

F. Removal during operation for evacuation of pus. Recent inflammation, 2; with recent perforation, 3; with concretion, 1; chronic inflammation, 4; stricture, 1; with recent perforation, 2; gangrenous ulceration and perforation, 2.

G. Spontaneous rupture of abscess into peritoneum. Stricture, 2; gangrenous perforation with concretion, 2. In one fatal case, appendix long, curls on itself, acute inflammation with slough.

H. In some fatal cases in which the appendix had not been removed during life. Partial slough, 1; slough away with part of caecum, 1; chronic inflammation, 1; concretion removed at operation.

Finding concretion in pus of abscess is no

sign that the cause of disease has been eliminated. Finding a concretion is a proof of the nature of the abscess but another concretion is just as liable to remain in the appendix.

The appendices following abscesses give fewer instances of apparent recovery than those found at operation for recurrent attacks without suppuration.

The appendix should be removed whether any symptoms occur or not. Even when appendix sloughs away, part of base may remain and is a dangerous condition. The incision should be made over outer border of rectus muscle; easy to approach and inspect area involved, can isolate thoroughly; permits exploration of any stricture from pelvis to gall bladder; veins are not bruised or torn, muscles are not lacerated or divided; often course is singularly free from suppuration and thrombosis or embolism.

The best time for removal is when abscess has recently closed as adhesions are not so dense and are easily handled. (W. D. H.)

SURGERY

THE RADICAL TREATMENT OF CARCINOMA OF THE BLADDER.

Albert Ashton Berg, *Annals of Surgery,* September, 1908.

The low percentage of cures in operations on the bladder for carcinoma, are due to the complicated problems the surgeon is required to meet, and the failure to appreciate the full pathology. The radical operative cure of a malignant bladder demands a wide removal of the diseased tissue and of the affected lymphatics and glands. The author quotes Mandlebaum as to the importance of recognizing the primary location of the cancer either in the prostate, rectum, or uterus; and says, for of what use is it to extirpate a part or the whole of the bladder, if thereby is removed only a secondary deposit, while the primary growth in the prostate, uterus or rectum is left unmolested? In the light of Dr. Mandlebaum's investigations (*Surgery and Gynecology,* V 315, 1907), the author does not doubt that many recurrences after radical operation, are due to the fact that an unrecognized primary focus existing in the prostate, uterus or rectum was left behind at the time of operation; and he is convinced that attention to the facts brought out by Dr Mandlebaum will better our percentage of ultimate cures. Besides facts concerning the pathology, the author deals with the two principal problems confronting the operator, viz., how widely to remove the neoplasm, and how best to restore or substitute for the urinary bladder? He quotes freely from Rafin as to the mortality in partial cystectomy, whose tables show 21 plus per cent of primary mortality; also from Watson, whose views differ as to the performance of partial cystectomy, and who advises lumbar nephrostomy with radical removal of bladder and prostate or other seat of primary infection. Of Watson's 25 collected cases of complete extirpation, 11 survived, and of these only two were alive and free from recurrence after three years; whereas, of Rafin's 96 cases of partial cystectomy, the 50 that survived and could be traced, included five that had safely passed the three-year limit without recurrence.

Relative to the question of recurrence, the writer is of the opinion that the dangers thereof are not materially dependent upon whether a complete or partial cystectomy be done, but upon whether all the cancer infected glands and lymphatics are removed with the primary tumor, as well as the prostate rectum or uterus if they be involved.

He differs with Watson relative to the indications for complete cystectomy with lumbar

nephrostomy, and advises partial cystectomy, with reimplantation of the ureter into the remaining portion of the bladder, when we are dealing with growths limited to a third of the bladder, and especially when their site is on the fundus or the lateral wall. When the cancer is diffusely spread over the greater part of the bladder, and a sufficient portion thereof to form a reservoir cannot be saved, or when there is a bad cystitis which does not yield to therapeutic measures, increasing the dangers of ureteral infection after reimplantation, then complete extirpation is advisable if the patient is otherwise sound. The preliminary operation of lumbar nephrostomy would certainly seem to be indicated when complete excision is done.

The author concludes from his own experience in four cases that one should be able to remove fully one-half of the bladder, without materially interfering with the functions of this organ, and that the removal of a third has no appreciable effect upon the function of the remaining portion. He concludes his very excellent paper with a description of his technic, and avoids the discussion of the removal of cancerous growths with the cautery or the curette. (P. B.)

Under the title of "A New Technic For Nephropexy," Dr. Alexander Hugh Ferguson gives not only a very vivid description of an entirely new operation for anchoring the kidney, but gives a most valuable list of indications for this operation. He says "Floating Kidney" is no longer a border line disease; it belongs to the field of surgery when—

1. Transitory hydronephrosis, due to kinking or folding of a ureter, and characterized by intermittent renal colic and other less prominent symptons, such as an irregularity in the quantity and quality of the urine voided.

2. Chronic hydronephrosis, with more or less atrophy of kidney tissue following a more or less permanent obstruction to the urinary flow through the ureter. The kidney may now become fixed away from its normal site.

3. Unilateral interstitial nephritis not infrequently is caused by the kidney floating. The classic symptoms and signs are present, with constant aching and occasional colic in the region of the wandering organ.

4. Acute torsion of the ureter, giving rise to great and constant pain, with, of course, enlargement and tenderness of the floating kidney.

5. Acute infection of a hydronephrosis—inflammatory symptoms constitutionally, chill, rapid pulse, fever, colic, pyuria, etc.

6. Suppression of urine in a floating kidney with Dietl's crisis bespeaks a condition that should be relieved by operation. The above mentioned conditions give rise to many local and remote disturbances. In addition to abnormal findings in the urine, e. g. albumin, bile, blood, casts, and pus, we often find the patient suffering with painful and frequent micturition; or headache and symptoms of uremia; or gastrointestinal disturbances, dyspepsia, vomiting, abdominal distress, constipation, and even diarrhoea. (P. B.)

(*Journal of the American Medical Association*, August 15, 1908.)

DERMATOLOGY

TREATMENT OF BURNS.

By L. Renner, in *Zentrabalt fur Chrir, Leipsic,* July 25, pp. 905-936.

He uses a powder of one part bismuth and two parts kaolin and has obtained good results in 100 cases. It keeps the surface dry, prevents infection, and is easily applied and renewed. (J. M. K.)

ON THE TRANSMISSION OF SYPHILIS TO THE THIRD GENERATION.

By V. Burgsdorf, Ann. de Derm. et de Syph., January, 1908, p. 18.

The question of hereditary syphilis has been very little understood, although certain authors affirmed the possibility of transmission, not only to the second, but also to the third, and even to the fourth generation. A. Fournier called the general attention to the subject in 1891.

Basing his opinion partly upon his own experience and partly upon the observation of Boeck, Atkinson, and others, Fournier, with Lannelongue and Besnier, affirms that syphilis can be transmitted to the children by hereditary syphilitics.

When we consider the works, the authors arrange themselves into two classes, as A. Fournier, Lemonier Lannelongue, Boeck, E. Fournier, Jullien, Troisfontaines, Hallopeau, Pospieloff, Generopitomtzeff and Strzeminsky believe that syphilis can be transmitted to the third generation, while others, as Finger, Hutchinson, Pellizari, Aubry and in particular Tarnovsky do not believe that the real disease cannot be transmitted to the third generation.

In spite of these opposite opinions the majority of authors admit that individuals of the third generation may bear anatomical or functional dystrophies, due to hereditary syphilis of their parents. The subject must be settled upon observations, and as they are very rare the following case is reported in detail by the writer.

Taking interstitial keratitis as the test of the presence of hereditary syphilis, Burgsdorf has made a minute examination of a case in which a little girl, age five years, was the subject of interstitial keratitis, poor nutrition, loss of hair and generally backward development. The father was found to be a corgenital syphilitic with numerous symptoms of that condition. Acquired syphilis could be excluded in the mother and the father and in the child itself and other possible causes of interstitial keratitis could also be regarded as non-existent. Treatment on antispecific lines resulted in rapid improvement of these conditions in the child. Cases well authenticated of the transmission of syphilis to the third generation, the possibility of which is widely disputed, are sufficiently rare to make this experience worth study. (J. M. K.)

NOTE OF THE COMPARATIVE INFLUENCE OF THE PARENTS IN HEREDITARY SYPHILIS.

(Ann. Dem. et de Syph., by Carle, Feb., '08, p. 93.)

The greater certainty of the contamination with syphilis when the mother is infected than when the father alone is syphilitic has been energetically supported by numerous writers, and Carle adduces three well narrated cases of healthy offspring resulting from the marriage of men suffering from syphilis in the early secondary period with women who remained uninfected, the children being born thirteen months, eighteen months and nine months after the appearance of the change in the father. In all three cases active treatment of the father had been undertaken but no treatment of the mother. The children resulting from the union were observed up to the age of one and a half to two years and showed no signs of syphilis. (J. M. K.)

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